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ROTUNDA

the magazine of the Royal Ontario Museum

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ROTUNDA

the magazine of the Royal Ontario Museum

Volume 23, Number 3, Winter 1990-91
Date of Issue: November 1990

4
THE GROWING COLLECTIONS
The ROM acquires a rare quillwork shoulder bag and an Egyptian girdle

7
WINE AND CULTURE
The Wine Museum of Torgiano

51
ARCHITECTURAL NOTES
The Building Blocks of Ontario

COVER
Zebra mussels, the latest threat to the Great Lakes, are shown clinging to the wall of an aquarium. To find out more about these pests turn to page 19.

PHOTOGRAPH COURTESY GERALD L.MACKIE

11
"CHRIST HEALING THE SICK CHILD" A TREASURE IN STAINED GLASS
Shirley Ann Brown
A stained-glass window is a fitting tribute to the humane character of John Ross Robertson

19
ZEBRA MUSSELS: THE GREAT LAKES UNDER SIEGE AGAIN
Gerald L. Mackie
Zebra mussels, the latest foreign intruders in the Great Lakes, are wreaking havoc with the native fauna and with local industry

26
PORTRAITS OF CANADA
Douglas Fetherling
Other countries have national portrait galleries. Why doesn't Canada?

34
WILDLIFE ART: COMMUNICATING AN ESSENTIAL VISION
David Barr
Although some wildlife artists and scientists may view the natural world from different perspectives, their visions prove to be complimentary

42
GALLERY GLIMPSES THE SAMUEL EUROPEAN GALLERIES
Sandra Shaul
There are always new treasures to be discovered

55
BOOK REVIEWS
- *Easter Island: The Mystery Solved*
- *Negotiating the Past: The Making of National Historic Parks and Sites*
- *The Natural History of China*
- *The Space Telescope*

62
QUIZ
It's the Weather

11

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EDITOR'S NOTE

THOSE ARE ZEBRA MUSSELS on the cover. In a world where fact is stranger than fiction, the zebra mussels that are infesting the Great Lakes are infinitely more menacing than killer tomatoes. Gerry Mackie from the University of Guelph, an expert on the bivalve pest, has written an unnerving account of the life cycle of the zebra mussel and also explains why the animal has become such a perfect nuisance. Zebra mussels are destroying the lakes for native marine life and causing enormous damage to underwater industrial equipment. So far, there is no solution to the problem of getting rid of these invaders. Even after the mussels have died, their byssal anchors continue to cling tenaciously to the surfaces on which the animals settled.

By looking at the wildlife art of painters George McLean and Bob Kuhn and sculptor Ken Bunn, the importance of conserving the environment is approached in a very different way by David Barr, a biologist at the ROM and curator of the Museum's exhibition *Wildlife: Images in Painting and Sculpture.* According to Barr, scientists provoke the public to action against the destruction of the natural world through warnings based on the analysis of data, while wildlife artists use another and equally effective tactic. McLean, Kuhn, and Bunn try to capture the most striking aspects of their animal subjects in order to touch the emotions of the public and thereby inspire it.

And it is wonderful when art is an inspiration. Shirley Ann Brown, an art historian from York University, recounts a story about John Ross Robertson, the colourful Toronto newspaperman and philanthropist. To commemorate the deaths of his wife and infant daughter, Robertson donated a window to the old Hospital for Sick Children on College Street, an institution to which he had been closely allied. He commissioned Henry Holiday, a renowned British stained-glass artist, to produce the exquisite window, and in so doing was able to make something positive of the very tragic incidents in his life.

I don't know if John Ross Robertson ever had his portrait painted, but cultural historian Douglas Fetherling relates how very significant this art form has been in our national records. After reading his article, you too will wonder why Canada does not have a national portrait gallery.

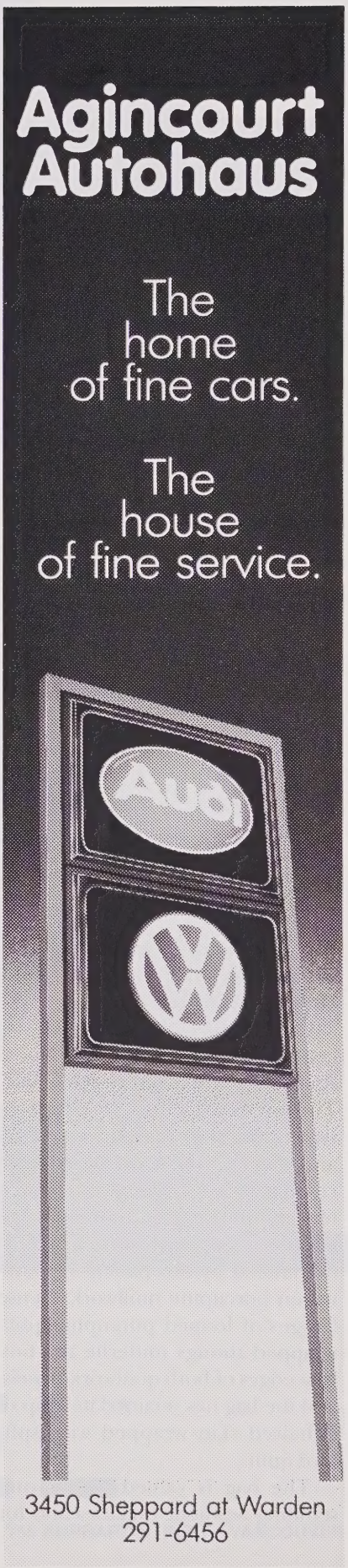
I'm a ROM employee that gets to every other institution's new galleries and exhibitions before our own. By assigning myself the final feature on the Museum's Samuel European Galleries I could leave my office to wander upstairs during business hours without the slightest sense of guilt. I've really enjoyed myself and if you haven't visited the galleries recently, or at all, take the time to do so.

As the full force of the holiday season descends, I have some uplifting news. The polybags for *Rotunda* and other membership mailings are now made from 60 per cent recycled material; *Rotunda* is printed on high quality, coated recycled stock; and all the material is affordable. The magazine can be recycled and the Museum's cooperative mailings in polybags have cut down our postage and the volume and cost of envelopes.

Have a happy and safe holiday.

Sandra Shaul

SANDRA SHAUL



The quilled shoulder bag (right) is worn by the Plains Cree chief who is lancing Chief Big Snake in the painting **The Death of Big Snake** *by Paul Kane.*

This Egyptian girdle completes the Museum's New Kingdom parure.

Rare Quillwork Shoulder Bag Acquired by ROM Department of Ethnology

THE ROM WAS VERY FORTUNATE RECENTLY to acquire a rare North American Indian quillwork bag. The bag is a Western Woods Cree type from the western subarctic, and dates to the early nineteenth century. It is composed of red and blue stroud, and is divided into two compartments with the front face dominated by two panels of loom-woven porcupine quillwork. Dense fringes of looped porcupine-quill-wrapped thongs underlie the bottom edges of both quillwork panels, and the bag has retained its strap of dehaired skin wrapped with split bird quill.

The bag is valued for its outstanding aesthetic qualities and for the mastery it displays in quillwork technique. It was also part of Paul Kane's collection of native artifacts. Paul Kane was a Toronto artist best known for his Indian portraits and scenes of native life. His paintings were worked up back in Toronto from pencil and watercolour sketches that he produced during two western journeys between 1845 and 1848. In addition to his sketches, Kane returned to Toronto with a collection of native artifacts, some of which he used as studio props for his oil paintings. The quilled bag was used in this way.

In a painting titled *The Death of Big Snake* in the Department of Ethnology, Kane depicts Big Snake, a Piegan chief, engaged in battle with a Plains Cree counterpart. Big Snake is lanced by the Plains Cree chief, who is wearing the quilled bag strapped over his right shoulder and resting against his left side. The depiction of the bag in the painting provides it with a cultural context. However, since the painting is purely a product of the artist's imagination—it was painted in Toronto before Big Snake's death—the accuracy of this context is questionable.

Nevertheless, the bag is a remarkable example of nineteenth-century Indian material culture. As well, the reunion of the bag with the painting preserves a part of Paul Kane's vision, technique, and legacy.

The Museum almost missed acquiring the bag. One and a half years earlier, the ROM had been outbid for it at an auction. The new owner applied for a permit to export the bag to the United States for

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resale. Canada was faced with the possible loss of one of its national treasures. Under the terms of the Canadian Cultural Property Export and Import Act a delay period was established during which the ROM had the opportunity to purchase the bag. With the generous financial assistance of the Carolyn Sifton Foundation Inc. and the support of a Cultural Property Grant from the Department of Communications the bag was eventually acquired and a permanent home in Canada secured.

KENNETH LISTER, *curatorial assistant, Department of Ethnology, Royal Ontario Museum*

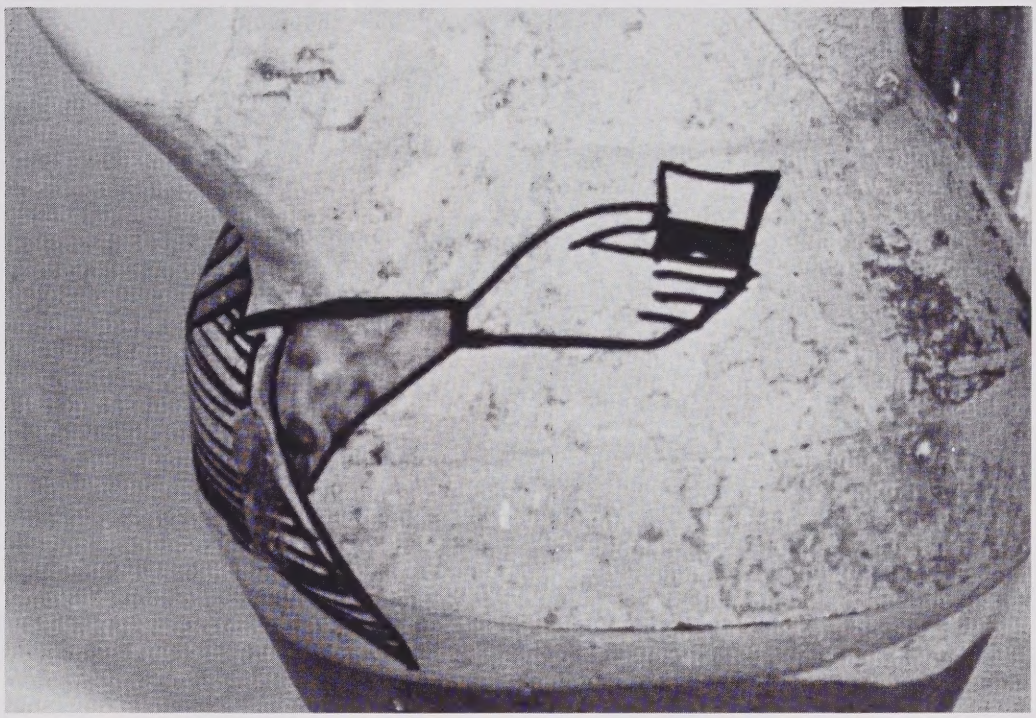
Girdle Tightens
Egyptian Collection

THROUGH THE GENEROSITY OF DR. Janice McPhail of Belleville, Ontario, the Egyptian Department of the Royal Ontario Museum has been able to complete a New Kingdom parure in its collection with the addition of a fine Eighteenth-Dynasty (1567-1320 B.C.) girdle.

Girdles were worn, resting on the hips, exclusively by women, and in many tomb paintings they appear as adornments on nude serving girls. Archaeological evidence shows that women of high rank also possessed girdles, wearing them under diaphanous gowns.

The Museum's girdle, typical of its period, consists of gold "wallet" beads separated by three strands of blue faience seed beads. The semicircular gold "wallets" have a shell-like appearance, possibly representing cowrie shells. When it was first acquired, the girdle was strung as a necklace with modern glass beads used as spacers. Susan Stock of the Conservation Department restrung the gold elements with ancient seed beads that had been in storage, using as her guide examples of girdles in other museums.

ROBERTA L. SHAW, *curatorial assistant, Egyptian Department, Royal Ontario Museum*



Detail from a typical Umbrian wine jug in the Wine Museum of Torgiano, Italy

The Wine Museum of Torgiano

WHEN THE GREEKS ARRIVED IN Italy towards the middle of the eighth century B.C., they called the country *Enotria Tellus*, the land of vines. This was not because of a proliferation of vines but rather because of the great affinity the vine displayed for the land and the superior quality of wine that could be produced in the new colony. With such a history of vine cultivation it is no wonder that a museum devoted entirely to the production of wine was established in Italy in 1974. It is just surprising that it did not happen sooner.

The Wine Museum of Torgiano came about through the efforts of the Lungarotti family, famous wine producers in the region of Umbria deep in the Etruscan heart of Italy. Situated in the village of Torgiano near the town of Perugia, the museum houses the private Lungarotti collection and is administered by the Lungarotti Foundation. The fifth-century building, known as Palazzo Baglioni has been restored, reproducing the dimensions of the old provincial Umbrian house that once belonged to the farming gentry. Although the rooms are not large they are well laid out for a small flow of visitors following a designated route.

Tourists attracted to the quiet rural countryside and the idyllic hillside villages of the region are amazed at the scope of the museum's collection. Fortunately, Le Tre Vaselle, one of the finest hotel-restaurants in central Italy, is set within the walls of Torgiano, offering comfortable rooms and traditional Umbrian cuisine. Such a charming hostelry encourages guests to linger awhile so there is no need nor even the desire to see everything in one day.

The facilities at Torgiano have enabled this small village to become an international meeting place each year when oenologists and journalists from around the world gather for the Banco d'Assaggio dei Vini d'Italia. As well as taking part in the judging of Italian wines from all over the country, the judges at the Banco always find time to make several visits to the museum to revel in the history of their favourite subject.

By name the wine museum would seem limited to viniculture and vinification, but various related aspects such as archaeological findings; medieval, Renaissance, and baroque pottery; and antique books and prints open up broad areas of

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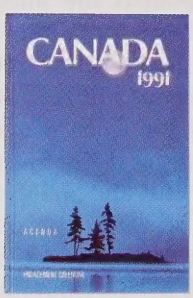

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research. Starting with the Middle Eastern origins of wine-growing, the museum follows its spread along the trade routes around the Mediterranean basin and the road network of the Etrusco-Roman era to focus on Umbria. Photographs, documents, maps, tools, and other objects enable visitors to see and to appreciate the primary importance of the vine and wine in a region characterized by a centuries-old closed economy.

In the main basement room a colossal beam press draws attention, in a very dramatic way, to the process of vinification. The press looks almost like a medieval battering ram or an instrument of torture, but its true function is explained by a series of diagrams and photographs, taken in 1970, of the last harvest in which it was used. A further room is dedicated to the craftsmen who were closely allied to wine production: coopers, smiths, and basketmakers.

In still another room the production of Vino Santo, the holy wine of Umbria and Tuscany, is featured. In keeping with the multifaceted wine traditions of the regions, Vino Santo is still a prominent part of many family occasions.

The highlight of the museum is its vast collection of ceramics. Since very ancient times pottery-making has been one of the most important handicraft activities in Umbria, and remains so to this day. Exhibits are divided into three sections: wine in food, wine in medicine, and wine in myth.

In the room devoted to wine as food, there are displays of mugs, flasks, goblets, and glasses set out in the chronological order of their production. Wine as medicine is presented by a display of ancient medical texts, vases that once held the herb or liquid that was mixed with wine, mortars, and other symbols of the art of healing. A tondo by Giovanni della Robbia showing a full relief head of the young Bacchus, the god of wine, and a dish by Mastro Giorgio da Gubbio, signed and dated 1528, depicting the childhood of Bacchus, are just two of the very beautiful items illustrating wine in myth.

Following a trip through the wine museum and a long, vacillating perusal of the postcards and posters for sale visitors can go right next door to the Osteria del Museo to relax and cool their throats by sampling the real thing from the local winery. It only makes sense that after treating the eyes for so long visitors may then satisfy their other senses as well in an atmosphere of heightened appreciation. It is not often that we are allowed both to see and taste tradition, to drink of an art that has been an integral part of civilization for millenniums. That, above all is what makes the Wine Museum and Torgiano so very special.

GERALDINE RUBINO
Geraldine Rubino is an oenologist and a Toronto-based freelance writer on wine

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"Christ Healing the Sick Child" A Treasure in Stained Glass

A stained-glass window is a fitting tribute to the humane character of John Ross Robertson

Shirley Ann Brown

In November 1892, John Ross Robertson, the founder-owner of the Toronto *Telegram*, presented the recently opened Victoria Hospital for Sick Children on College Street with the gift of an impressive stained-glass window. It was installed in the entrance hall of the neo-Romanesque building, on a landing part way up the monumental staircase leading from the street level foyer to the main floor. At slightly more than two metres wide by three metres high, it could not easily be ignored by passersby on the street nor by those who were negotiating the staircase. In the official deed of gift drawn up by Robertson's lawyers, it was stated that the window had cost the princely sum of $3000.

John Ross Robertson was closely connected with the building of the hospital from the outset in 1889 and remained the powerhouse behind it until his death in 1918. As chairman of the board he ran the hospital with much the same autocratic spirit as he ran his newspaper. He shaped its destiny more than any other man, and in his will he stated that upon the demise of his direct heirs, the *Telegram* was to be sold and the proceeds were to be given to the Hospital for Sick Children. His bequest was completed in 1949.

John Ross Robertson, founder of the Toronto *Telegram*, politican, and philanthropist

Robertson was first attracted to the Hospital for Sick Children after his only daughter Helen Goldwin (named after his close friend Goldwin Smith) died of scarlet fever in March 1881 at the age of 11 months. Her young cousin Grace died on the same day. To make matters worse, the Robertsons were in England when the deaths occurred. The infants' mothers became volunteers at the hospital and Robertson became an energetic supporter of the cause. Tragedy struck again when Robertson's wife Maria Gilbee died in August 1886 at the age of 39, still grieving over the loss of her daughter. Robertson remarried a year later, and as a memorial to Maria and "Goldie," he donated the stained-glass window to the hospital.

The bottom half of the window shows the courtyard of a stone building in which a standing Christ lays his hand on the ban-

PHOTOGRAPHY COURTESY THE BALDWIN ROOM, METROPOLITAN TORONTO REFERENCE LIBRARY

Shirley Ann Brown is an associate professor of art history at Atkinson College, York University

daged head of a sick child held in the lap of its concerned mother. In the upper half of the window there is a group of angels, gently wafting heavenwards in a swirl of drapery, cradling infants in their arms, accompanied by the inscription "He shall gather the lambs in His arms." The two sides and surmounting arch of the window were completed with a band of foliage inhabited by nude male children and enlivened by the colour of four deep red poppies. The dedication inscription was placed along the bottom.

Henry Holiday, the artist chosen for this commission, had been since the late 1860s a highly successful and prolific stained-glass artist in London, England. By the time of Robertson's commission in 1891, Holiday had achieved a reputation in the United States and had executed many American commissions; however, he had not made any inroads into the Canadian market.

Robertson's choice of Holiday for his stained-glass commission resulted in a touching memorial to his daughter and wife and a fine piece of art for the Hospital for Sick Children

It is still not known how Robertson came to choose Holiday. In 1890, the artist toured the eastern United States and Canada, making a brief visit to Toronto, which he did not dwell upon in his *Reminiscences* published in 1912. There is no trace of personal correspondence between artist and patron even though Holiday was normally an inveterate notewriter. The hospital archives have nothing on record except the preliminary line drawing that Holiday sent to Robertson for his approval and an early black-and-white photograph of the completed window. A small coloured sketch of the lower half of the window is in a private collection in England.

Holiday's affinity with England's Pre-Raphaelite movement is clearly shown in the window's design. Although never a formal member of the group, he was friends with Edward Burne-Jones, whom he replaced as stained-glass designer at Powell and Sons of Whitefriars (London) in 1863, as well as with William Holman Hunt and Ford Maddox Brown. He also knew William Morris and shared the socialistic and artistic values of the Arts & Crafts Movement. Holiday's academic training from the Royal Academy of Arts, which gave him a mastery of drawing, is evident in the anatomical renderings of the angels in the Toronto commission.

Henry Holiday, the highly successful and prolific English stained-glass artist

After leaving Powell's in 1890, Holiday opened his own studio in Hampstead in January 1891, where he could maintain the close control over glass production that he could not have at the commercial firm. The hospital window was one of the first to be produced in the new premises. Like all European stained-glass designers, Holiday chose to work with clear coloured glass, rejecting the use of the milky, streaked, or opalescent glass favoured by such contemporary American designers as Tiffany and LaFarge. The rich, glowing colour of the window is the result of the assiduous attention paid to the choice of each piece of glass used. Working with the time-honoured techniques of the Middle Ages, Holiday used only one paint, a vitreous brownish substance, and silver stain. Both were fired onto the surfaces of the glass in a kiln. The delicacy of detail in the facial features and patterns on Christ's robes is outstanding in the hospital window.

Holiday was adamant that stained glass was a medium for true and original artistry, and he published his views in *Stained Glass as an Art* in 1896. Here he explained how creating a stained-glass window was different from painting, and more than a mere craft. As an art form he felt that it had to break out of the shackles imposed by the Gothic Revival mentality. That Holiday was pleased with his window for Toronto is apparent, for he cited it several times in this book. He reproduced the line drawing for the window and discussed the design as an excellent example of how to combine artistic composition with the ironwork grid necessary for stability in a large stained-glass window.

In a window of this size, the iron bars are needed to secure the glass panels into the architectural framework and are usually set directly into the building stone. The ironwork must also be designed to distribute evenly and to support the tremendous weight of the window and to prevent it from buckling and bulging. There are a number of ways in which the problems can be tackled, and in this window the iron saddlebars are arranged so that they produce a series of horizontal lines, none of which accidental-

PHOTOGRAPHY FROM REMINISCENCES OF MY LIFE BY HENRY HOLIDAY

ly interferes with the facial features of the figures. The shape of the window opening is repeated in the ironwork, which delineates the broad foliate border from the principal subjects and, at the top, imitates the radiating stone voussoirs of the building's framing window arch. Holiday wrote that it was always best artistically to relate the design of the window to that of the architecture into which it was set, and here he manipulated the ironwork design to that end.

Figures were always the main component of Holiday's art, for he saw the human figure as the subject of the highest aspirations of painter or sculptor. For Holiday, a complete understanding of the human form was the essential basis for depicting the nobility of the human spirit, and he draped his figures so that the bodily form showed clearly through the thin folds. The figures were always graceful, beautiful, and of noble bearing. Although he appreciated and praised medieval stained glass for its glorious colour and light, he was always primarily a painter, and for him the painter's art really began with the Italian artists of the early Renaissance who made the human figure the central aspect of their art. While in his twenties he had made his first trip to Italy where he studied the figures of Giotto, Botticelli, and Mantegna. These images were to remain forever with him, and in his own figures he combined the languidness of Botticelli and the Pre-Raphaelite painters with the monumentality of Mantegna. Italian art continued to inspire him and he made many more trips south. The statuesque, idealized, and self-confident figure of Christ in the window blends gentleness and beauty with authority. His movement is slow and stately, and the mother looks up to him earnestly and with hope.

But Holiday was also familiar with the turmoil that Charles Darwin caused when his evolutionary theories were published in the 1850s. The artist felt he could combine these new ideas with his own ideas about the nobility of humanity. In *Stained Glass as an Art* he wrote,

> *The history of the human being, studied in the light of evolution, shows a gradual diversion of the organs of the body from animal to spiritual functions....We have only to suppose this gradual change of function to reach its consummation in order to conceive a wholly spiritual being in the very likeness of man. This speculation does not appear to be at variance with spiritual or scientific thinking, and while recognizing that man at his highest is but a little lower than the angels, it gives something like a rational basis for the necessarily anthropomorphic representation of angels in works of art.*

Holiday was prompted to make this statement because most of his stained-glass commissions were for religious settings and very often required the representation of angels. Undoubtedly in reaction to other popular stained-glass designers who were creating angels based upon late Gothic models, Holiday chose to portray his angels in the same fashion as he portrayed mortals, and not to differentiate them by size or costume. Holiday must have been criticized for his beautiful and sensuous angels, for he took great pains to state clearly what they should *not* be. He was totally against the prevailing trend in late Victorian stained glass to represent angels in the heavy ecclesiastical garments of the late Middle Ages, a trend which he saw as outmoded and artificial. He saw all angelic representation as symbolic by nature. In his words, "Symbols ought not to clash with each other, and when we have given angels wings to convey to the eye the impression of free and rapid movement, it is surely an artistic blunder to clothe them in such weighty garments that the wings be-

The "Christ Healing the Sick Child" window as it appeared in the old College Street building of the Hospital for Sick Children

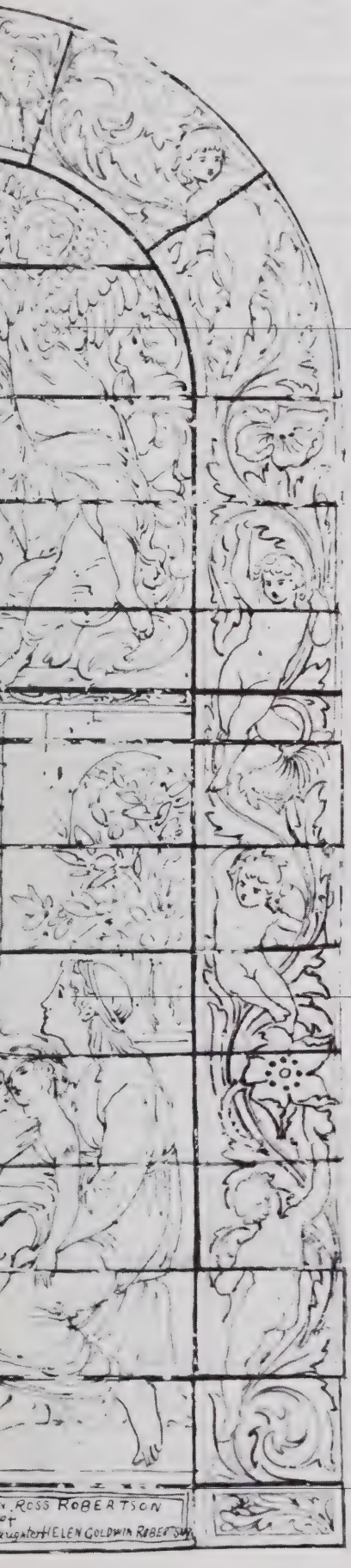
PHOTOGRAPHY COURTESY ARCHIVES OF THE HOSPITAL FOR SICK CHILDREN

This line sketch, signed and dated Henry Holiday 1891 in the lower left corner, is in the Archives of the Hospital for Sick Children. The sketch would have given Robertson a clear idea of the window's layout and design.

Angels, cradling the souls of infants in their arms, float gently heavenwards in a swirl of drapery. Two children are mostly hidden in the drapery and one child is shown fully as a memorial to Robertson's deceased infant. In the actual window there is an inscription at their feet that reads: "He shall gather the lambs in His arms."

The two sides and surmounting arch of the window are completed with a band of densely packed acanthus-type leaves, inhabited by nude male children and decorated with poppies, flowers known for their healing power. The use of foliage was a Holiday trademark and commonly used by the Pre-Raphaelite and Arts & Crafts artists. However, it was unusual for Holiday to combine foliage with wingless figures of children. This probably shows the influence of early Italian art.

The bottom scene of the window depicts the courtyard of a stone building in which a standing Christ lays his hand on the bandaged head of a sick child held in the lap of its concerned mother. Although Holiday appreciated the stained-glass technique of medieval artists, his appreciation of the human figure is based in Italian Renaissance art. The graceful, beautiful, and noble figures of Christ and the mother clearly show the bodily forms beneath the thin folds of the drapery.



Holiday felt that humans were just a little lower than angels on the evolutionary scale. Consequently, in great contrast to the heavily clothed Gothic and Victorian Neo-Gothic angels, Holiday clearly portrayed angels as mortals with wings. His angels are beautiful and sensuous beings fulfilling heavenly missions.

Although Holiday did not distinguish his angels and mortals by fashion or proportion, the earthly and mortal sentiments of the mother, looking earnestly towards Christ, are a poignant contrast to the angels' ethereal expressions. Like many other stained-glass artists, Holiday kept an inventory of his figures and compositions, which he could draw upon and modify with each new project.

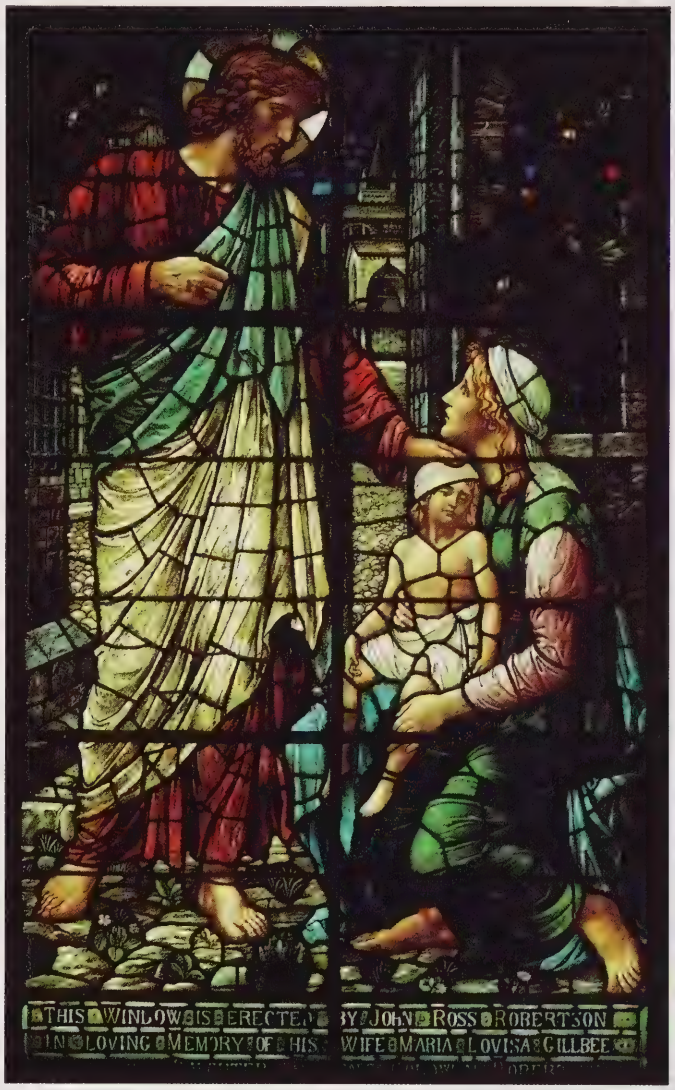
As the dedication shows, John Ross Robertson commissioned the stained-glass window for the Hospital for Sick Children as a memorial to his daughter who had died of scarlet fever when only 11 months old and to his wife who died at the age of 39, still grieving for their daughter.

PHOTOGRAPHY COURTESY ARCHIVES OF THE HOSPITAL FOR SICK CHILDREN

come futile, and merely ornamental appendages."

And so Henry Holiday's angels became exalted human beings, exhibiting beautiful, frankly androgenous bodies in an openly narcissistic manner, covered in clinging drapery folds moulded by and revealing the forms beneath. In the upper part of the window in the Hospital for Sick Children, six of these figures ascend heavenwards, carrying the souls of babies gently enfolded in their bare arms. As Christ is heavily earthbound, walking solidly on the pavement of the courtyard below, the angels above twist and turn, freed from the constraints of gravity as they fulfil their role as celestial messengers. One child is shown fully while two others are mostly hidden in the swirls of drapery. How suitable a monument this is to the memory of the deceased Robertson infant.

Holiday first worked out the generic design for his group of ascending angels several years earlier in 1883-84, when he created a large ten-light window for the east wall of the parish church at Upholland in northwest England. The upper five lights represent the Ascension of Christ into Heaven and show him in the centre accompanied by ascending angels distributed over the four side lights. Holiday had worked very hard to arrive at his design for this angelic group and was satisfied that it showed upward movement besides filling the openings fully. He described these angels in *Stained Glass as an Art* by saying, "Having spent much time and thought on the ascending angels of this work, I hoped for an opportunity of making use of them again and found more than one occasion." He mentions the Toronto commission and another one for Salisbury Cathedral, also produced in 1892, where the two groups of angels flanking Christ in Upholland are united into one group. There are variations of this composition in several other Holiday windows.



The lower part of the window with the foliate border removed, now mounted in a light box in the surgical waiting room

It was very common for stained-glass designers to reuse sections of designs and cartoons and Henry Holiday kept his drawings carefully labelled and filed in his studio. Complete window designs were seldom, if ever, reused, but a carefully worked out and successful group of figures, such as the Upholland angels, could be mined many times. Changes were made as desired or needed, and drawings could easily be reversed.

In the window for the Hospital for Sick Children, the two main scenes were originally separated by a decorative band and united by a foliate border. The border is composed of densely packed acanthus-type leaves executed in grisaille glass, inhabited by nude children and marked by blood-red poppies, a flower chosen for its healing powers. Once again Holiday referred to this window in his book as a good example of his ornamentation.

Floral and foliate design was a decorative mainstay of the Pre-Raphaelite painters and the Arts & Crafts designers, and Holiday used much of it to fill in the non-figural parts of his window designs. He believed that ornament should be based on natural forms, and that the artist must translate the free and irregular growth of natural foliage into a language of rhythmic order with recurrent forms. Holiday's design was also influenced by early Italian ornament, which he saw as reflecting some ideal flora that was actually rhythmic and symmetrical in its growth, and which harmonized perfectly with naturally drawn figures. The type of white-grey leafy design found on the Toronto window had become a Holi-

PHOTOGRAPHY COURTESY SHIRLEY ANN BROWN

day trademark by the 1890s.

It was rare, however, for Holiday to combine fleshy foliage with wingless figures of children as he did in the border of the hospital window. The combination was a variation on the inhabited vine or scroll designs, found first in the art of late antiquity, that can be seen in the mosaics and sarcophagi exhibited in the museums and churches of Italy. Holiday would have seen these works during his travels.

By choosing Henry Holiday to create the window that would perpetuate the memory of his wife and daughter as well as acknowledge his contributions to the Hospital for Sick Children, John Ross Robertson introduced the work of this master to Canada. In its original form the window was a masterpiece of the late Victorian Pre-Raphaelite aesthetic that made a contrary statement to the Gothicizing tendency of much nineteenth-century glass. As such the window deserved a better fate than it has had.

The hospital agreed that it would be responsible for keeping the window perpetually in repair, and that if new premises were ever to be built, the window would be placed in the new hospital and maintained there. However, the window, in the Hospital for Sick Children now located on University Avenue at Elm Street, is not nearly so magnificent as it once was, and the years have taken a serious toll. It has been divided, not too successfully, into two parts: the lower section is mounted in a light-box in the surgical waiting room outside the chapel on the second floor and the upper half has been placed across the corridor in the semi-privacy of the hospital library.

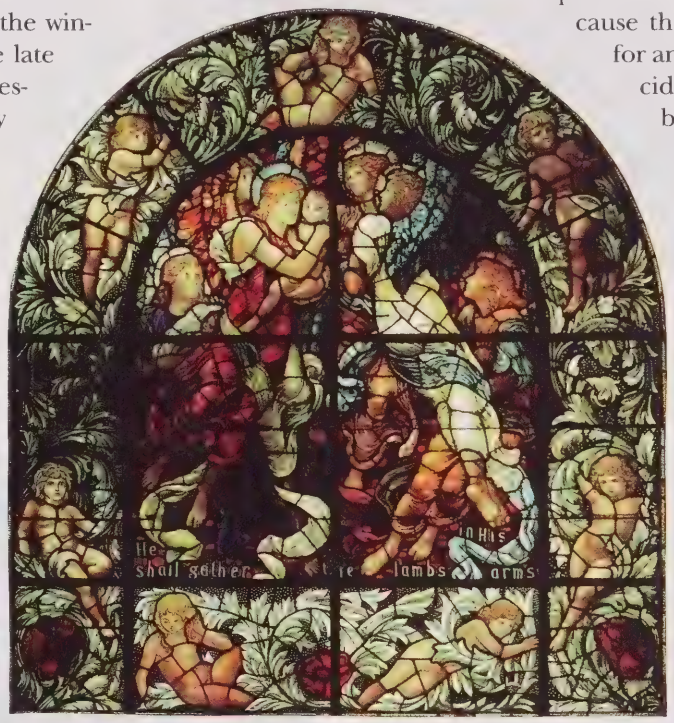
The window was dismantled, and rather badly damaged in the process, when the hospital on College Street was torn down. No provision was made for it in the hospital's new location on Elm Street. Only the panel showing Christ blessing the sick child, removed from the rest of the window, was reinstalled in 1951 in an outside wall of the first-floor lounge. In 1966, when the hospital was renovated, the partial window was removed from this setting and installed with artificial backlighting in its current location where there is risk of damage from chairs and other objects placed up against it.

The upper portion of the window and the border were "put into storage" in 1951, and their location was subsequently forgotten. It wasn't until 1976 that the glass was located in boxes in a room on the eleventh floor of the Elm Street Wing.

These remains were sent to the Robert McCausland Stained Glass Studios in Toronto for repair and reassembly. It was impossible to reunite the two halves because there was no suitable location for an installation, and so it was decided that pieces of the foliate border would be used to continue the band around the bottom of the angel panel so that it would not appear so truncated. This panel was mounted in the library in 1977.

Other examples of Henry Holiday's work can easily be seen by the general public in and around Toronto. There is the window in the nave of Christchurch Anglican Cathedral in Hamilton, executed in 1892, and three scenes of domestic life in ancient Egypt produced in 1912-14 for the stairwell landing of the building for the Faculty of Household Sciences, University of Toronto, now the Office of the Ombudsman of Ontario, across from the ROM. The Museum also has in storage an opus sectile panel with a beautiful seated angel. Henry Holiday was a close friend of Charles Currelly, the founding director of the ROM, through whom arrangements for the acquisition of the angel panel and the Egyptian panels were made.

It is a tribute to John Ross Robertson that he could find some way to create something positive in the face of enormous tragedy. Toronto has a fine children's hospital and Canada has some wonderful examples of stained glass by an outstanding nineteenth-century master.



The upper part of the window with the extra foliate border added along the bottom, now mounted in the library

PHOTOGRAPHY COURTESY SHIRLEY ANN BROWN

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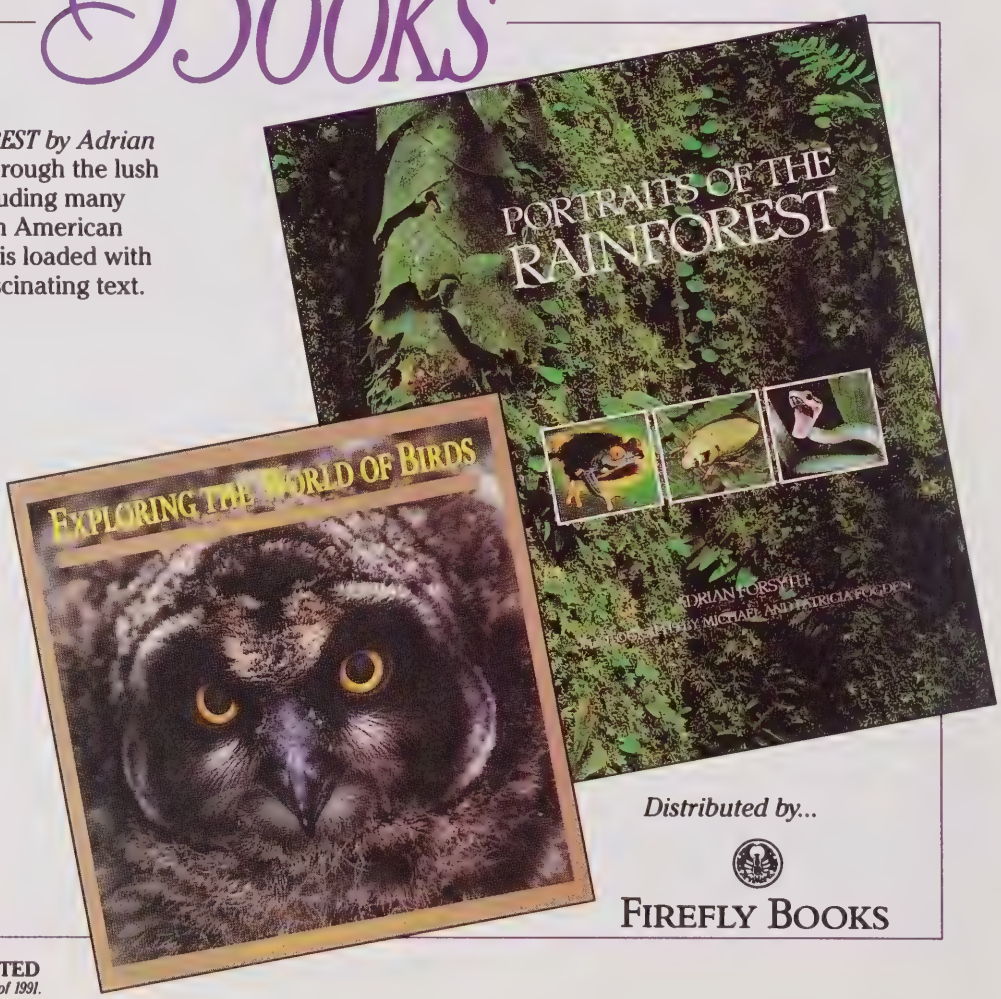

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Zebra Mussels: The Great Lakes Under Siege Again

Zebra mussels, the latest foreign intruders in the Great Lakes, are wreaking havoc with the native fauna and with local industry

Gerald L. Mackie

ZEBRA MUSSELS SHOWN APPROXIMATELY 2.5 TIMES ACTUAL SIZE. PHOTOGRAPHY BY GERALD L. MACKIE

Together, the Great Lakes form a haven for aliens. In the past 100 years, man has been introducing exotic species of animals into the lakes at a rate of nearly one species every year. In a recent study for the Great Lakes Fishery Commission, Dr. Edward Mills of Cornell University and Dr. Joseph Leach of the Ontario Ministry of Natural Resources have recorded at least 80 exotic introductions into the Great Lakes since the late 1800s, and they are still counting. Most of these species are benign and have done little more than increase the diversity of animal life in the lakes. Some, however, have proved disastrous and have literally ploughed their way into every available habitat in the Great Lakes.

First it was the sea lamprey, a marine predator that entered the Great Lakes in the late 1920s by attaching itself to the hulls of ships. Its numbers were barely detectable for 10 years. And then, like a siege, it happened. The growth rate of the lamprey population exploded, increasing more than 20-fold with each generation. During this explosion, the sea lamprey devoured almost every lake trout and sturgeon. Hundreds of millions of dollars were lost in commercial fishery revenues and hundreds of millions more were spent to bring this alien pest under control. Even today more than $9 million is spent annually to keep the lamprey under control.

Now it is the zebra mussel, *Dreissena polymorpha*, a small shellfish shaped like the edible blue mussel, but distinguished by the zebralike stripes on its shell. Introduced to the Great Lakes through the discharge of bilge water from European ships, the zebra mussel population growth is so rapid that this animal is likely to prove more devastating than the lamprey or even an oil spill. At least the lamprey has been checked and an oil spill can be cleaned up, but to date the rapid expansion and spread of the zebra mussel population in the Great Lakes is uncontrollable.

The zebra mussel is a small mollusc (usually less than three centimetres long) that belongs to the family Dreissenidae. Its species name, *polymorpha*, refers to the

Gerald Mackie, one of the foremost experts on zebra mussels, is a professor in the Department of Zoology at the University of Guelph

highly variable patterns of zebra stripes on its shell, with some specimens being albino, others pure black or pure brown. There is only one North American dreissenid relative, *Mytilopsis leucopheata*, a brackish water species common in the southern Atlantic coast region. Within freshwater environments, the zebra mussel is related to a group of native bivalves called the fingernail clams (of the family Sphaeriidae) and to another exotic invader called the Asiatic clam. The zebra mussel and the Asiatic clam share many troublemaking characteristics.

One of the main reasons why the zebra mussel is such a pest is that it has been able to exploit a habitat previously unused in the Great Lakes: the surfaces of solid objects such as rocks, break walls, bottles, cement blocks, tires and even sunken cars. Native bivalves and Asiatic clams live in mud and sand, whereas zebra mussels live on solid objects. Anything solid and submerged, including the inside walls of pipes, makes an ideal habitat for zebra mussels. When the zebra mussels first arrived there was no competition for space. Now, however, the mussels must compete amongst themselves; this will eventually lead to a decline in their numbers to a level that the habitats can support.

Zebra mussels can live where other Great Lake life cannot. Everything from the surfaces of rocks and break walls to sunken cars and other shellfish is home. The mussels also clog the inside surfaces of underwater pipelines, and their tough anchoring byssus makes them extremely difficult to remove, even after death

In addition to a body form perfectly designed for living on solid surfaces, the zebra mussel has three other characteristics, which enable it to live in such a habitat. First, it produces free-swimming larvae, called veligers, which swim in the water for a while and then settle onto the solid surface that will become their home. Second, the newly settled adults can immediately produce strong byssal threads that anchor them in place. And finally, zebra mussels have very large siphons to pump enormous quantities of water over their gills in order to filter out food.

Zebra mussels cling with extraordinary tenacity to hard surfaces. Byssal threads are secreted from the byssal gland in the animal's foot at the rate of about 12 a day. The threads are first liquid. They have a small base plate, and the colour turns from white to tan and finally to brown. They are made of a tough, sclerotized protein called conchiolon. A single adult can produce as many as 200. In their first year, zebra mussels can readily detach themselves from the byssus, move to another location, and secrete a new byssus.

When the number of mussels is so great that the animals are literally side by side and on top of each other, the byssal threads attach not only to the solid surface but to the neighbouring animals as well. As the mussels settle on top of one another, byssal threads attach one layer to the next. Hence aggregations up to about 30 centimetres in depth can develop. The only way to remove the aggregation is to scrape the bottom layer of mussels from the solid surface. This tendency to byssally attach to each other and to the surface is causing major problems in industrial and domestic pipelines because many mussels remain attached to the inside walls even after they are dead.

Asiatic clams also clog pipelines but in different ways. Because the byssal gland is non-functional in adults, the adults rattle about in the pipelines and aggregate at strainers and confluences causing a reduction in water flow at these points. Zebra mussels block the openings by growing inwards from the internal walls. Both species enter industrial and domestic facilities as veliger larvae and settle there as adults.

Another reason why zebra mussels pose such serious problems is the amazing rate at which the population increases. Zebra mussels are either male or female (the sex ratio in Lake St. Clair is currently three females to two males) and they are the only freshwater bivalve whose eggs are fertilized externally by sperm in the lake water. Each female produces 30,000 to 40,000 eggs. In spite of this incredible fecundity, it is estimated that less than one per cent of the veliger larvae survive predation, parasitism, and other dangers as they settle to the lake bottom. Why then are there so many adults?

Suppose that only one male and one female had been introduced into Lake St. Clair in 1985 and that the female had produced 30,000 eggs. After one year, if only one per cent of the eggs had matured and reached adulthood, there would have been 300 more zebra mussels in Lake St. Clair, two-thirds of them (200) female. After another year some of these females would have died. However, if 50 per cent of the females did survive, there would have been 100 left to reproduce in the second year. Females produce up to 40,000 eggs in their second and third years of life. Therefore in 1987, the second year, a total of 4 million larvae would have been pro-

duced by the original surviving females. If one per cent of these had survived, the mussel population of Lake St. Clair would have increased by another 40,000 or 400 times in one year.

At this rate, every square metre of the lake would be covered in two to three years and then the zebra mussels would start to settle on top of each other. This is precisely what is happening. Layers of mussels have been formed, some more than 15 centimetres deep, with the oldest mussels at the bottom and the youngest at the top.

Asiatic clams are also either male or female, but fertilization takes place internally in the top region of the gills. They release 25,000 to 75,000 veliger larvae into the water.

Fingernail clams are hermaphroditic and brood their young in pouches on the inner gill. Because internal space is limited, only a few young are produced, usually between 10 and 40 per parent, depending on the species. There is about a 40 to 80 per cent mortality during larval development, resulting in only 2 to 20 survivors.

Pearly mussels, Great Lakes bivalves unrelated to the zebra mussels, are either male or female and fertilize their eggs internally; they also have internal brood pouches. Although they produce up to 1 million larvae, the survival rate for larvae reaching adulthood is only 0.001 per cent (i.e. 10 per parent animal). It is little wonder that zebra mussels are overwhelming the native fauna.

Zebra mussels and Asiatic clams are the only two species of freshwater bivalve that foul the environment. Unfortunately they are also the only two freshwater species with free-swimming veliger larvae, and their rate of development and survival from the larval to adult stage is much higher than in related species.

Eggs of the zebra mussel are first released into the water in late May to early June. They go through a number of forms, stages, and states until they finally settle on a solid underwater surface and secrete the byssus anchor. It takes only 20 to 30 days for the larvae to develop into the adult settled state in which they will pass their two- to three-year lifespan. However, larvae can be found in lake water until the end of October because neither the adults nor the larvae develop at the same pace. Fertilization of the eggs can be delayed by hours by low water temperatures.

The Asiatic clams have a similar life cycle but the larvae develop into adults in only three to five days. Newly settled larvae also secrete a byssus, but the byssal gland becomes non-functional during the first year of life as the adult clams burrow into the sediments. Asiatic clams live for two to four years.

Fingernail clams brood their larvae in a

PHOTOGRAPHY COURTESY DR. DON SCHLOESSER, U.S. FISH AND WILDLIFE

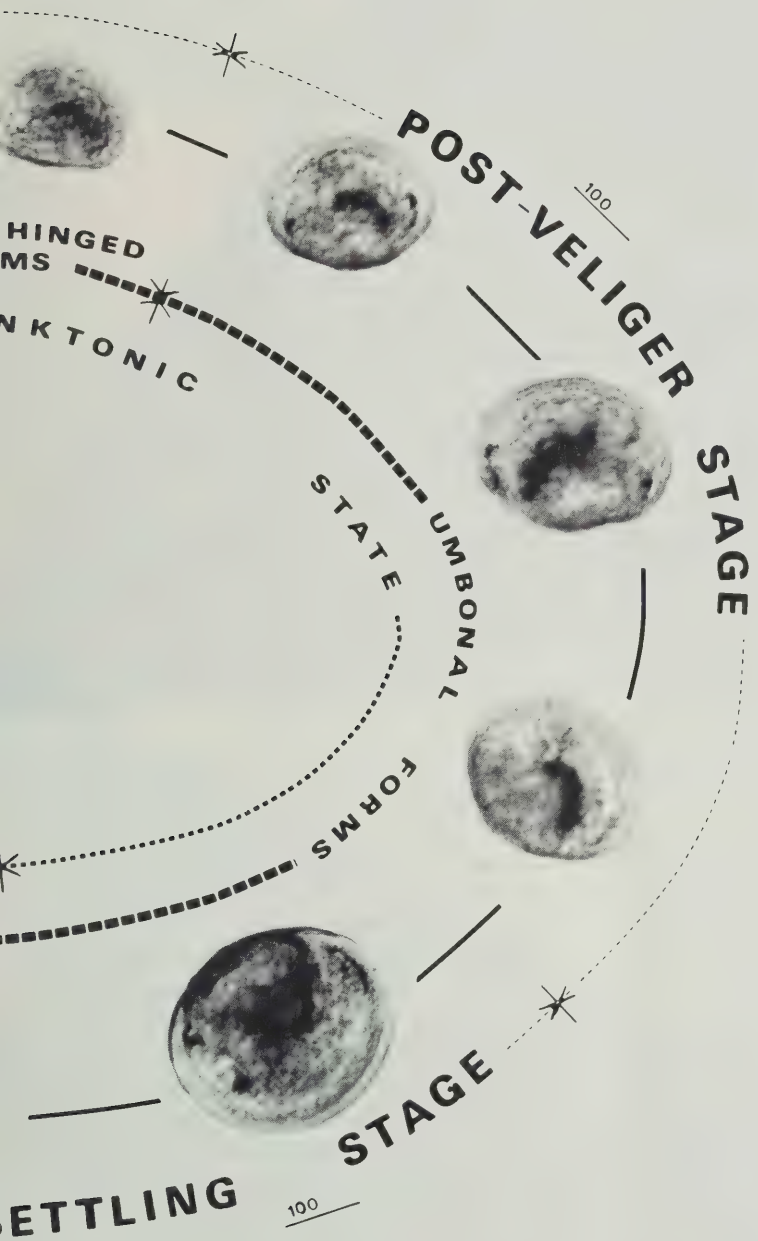
Even predators, like the crayfish, are not immune from zebra mussel infestations. Fortunately, the crayfish can rid itself of its mussel coat by moulting at regular intervals.

The eggs first develop into veliger larvae, that is larvae formed so that they can swim freely. At this time the mussels' shells becomes straight-hinged. This is the easiest of all the veliger stages to recognize.

Zebra mussels are either male or female. Their eggs, which are released into the lake water in late May to early June, are fertilized externally by sperm, also released into the water. It only takes 20 to 30 days for a fertilized egg to mature into the settling or benthic state.

The settled mussels begin to lead an adult life in the benthic or settled state. At this time the zebra shell pattern develops fully.

CHART BY GERALD L. MACKIE



In the post-veliger stage the larvae begin to lose their ability to swim. Their shells become umbonal, or heavier and more rounded as calcium is added.

From the egg stage until the final settling stage the zebra mussels are in a free-swimming or planktonic state. However, at the end of this stage as their shells becomes heavier, the mussels settle and secrete the byssus anchors that will hold them firmly in place.

series of brood sacs. During the last stage of development the larvae mature outside the sacs for a period of one to two months. The newborn are miniatures of the adults and most species live for only one year or less.

Pearly mussels and other unionid clams produce up to one million parasitic larvae called glochidia. Many glochidia can develop into young juveniles only on one particular species of host fish. The female clams release large clouds of larvae into the water. Larvae enter the gill cavity and tissues of the host fish during the fish's normal respiratory activities. They feed on fish plasma for about a month, until their own internal organs are developed, and then as young juveniles they leave the fish and drop to the bottom of the lake or river to begin a free-living existence.

Zebra mussel populations can increase at a rate of 400 times per year. In addition, the mussels' enormous appetites rapidly clear the water of infested lakes. Crystal clear water may appeal to people but it signals a shortage in the food column for other animals

Only about 0.001 per cent of the glochidia reach adulthood, either because they cannot always find the proper host fish or because they are preyed upon by fishes, waterfowl, and mammals. Although pearly mussels produce as many eggs as zebra mussels, the zebra mussels are at least 1000 times more successful in reaching adulthood. However, pearly mussels may live up to 20 years or more, considerably longer than the mere 2 to 3 years for zebra mussels.

It is during the veliger larvae stage that the greatest dispersal of zebra mussels and Asiatic clams takes place. Dispersal rates of fingernail clams and pearly mussels are almost negligible in comparison.

The larvae can be transported great distances in river and lake currents. In 1989 zebra mussels spread eastwards from the central basin in Lake Erie at a rate of 250 kilometres per year. Canal systems enhance dispersal among watersheds, and currents can also transport adults that are attached to logs and other floating objects.

Adult zebra mussels attach themselves to the hulls of small boats; by this means they are transported upstream as well. Because the mussels are able to survive out of water in humid environments for up to 14 days, and in arid environments for 2 to 3 days, they can hitchhike a highway ride on the hulls of boats to freshwater lakes on either coast. Of course, the conditions in the new lake must be suitable for the mussels to survive.

Two of the more important physiological factors for growth and reproduction are the temperature and suitable ion composition of the water.

Zebra mussels need an environmental temperature of 10°C to 12°C to initiate growth and 14°C to 17°C to initiate reproduction. Larval development is optimum at 20°C to 22°C. Mean summer temperatures of 25°C to 27°C severely depress growth and development of the veliger larvae. If 15°C is the lower limit and 24°C the upper limit of average environmental temperatures required for optimum growth and reproduction, then about two-thirds of the North American continent has inland surface waters with temperature ranges that will support large populations of zebra mussels.

Although zebra mussels may not grow or reproduce outside of optimum conditions, a few can still survive. More than three-quarters of the inland lake surface waters of North America have conditions that will support some degree of zebra mussel infestation.

Zebra mussels, like all molluscs, need calcium to build their shells, and they need more than most. Calcium levels of 40 milligrams and more per litre of water are best. Many of the lakes in Canada and the United States that have been affected by acid rain have calcium levels that are too low—less than 5 milligrams per litre—to support zebra mussels. These include most lakes in the Muskoka and Haliburton districts of central Ontario and in the Adirondack Mountains of New York State. Only lakes with watersheds on limestone outcrops will support large populations of zebra mussels.

Because of their enormous numbers, zebra mussels are unrivalled in their capac-

ity to clarify water. Since the introduction of zebra mussels, the water clarity in Lake Erie has doubled. Perhaps this is only coincidence; however, if it is the zebra mussels that are clarifying the water, then they are removing suspended materials such as algae and dissolved nutrients like nitrogen and phosphorous, as well as calcium carbonate and other minerals.

Zebra mussels are able to accelerate the conversion of toxic nitrogenous wastes (ammonia, nitrite) to nutrients for phytoplankton (microscopic plants in the water column). While this is beneficial to some organisms, the mussels are stripping the water of nutrients that were once the exclusive property of phytoplankton and algae, which are in turn the food for zooplankton and native bivalves. The native bivalves may not have to compete for space with the zebra mussels, but they are engaged in strong competition for food. It takes the zebra mussel population only three days to filter all the water in Lake St. Clair. Since it takes nine days for water to flow through the lake before it enters the Detroit River, the rapacious zebra mussels can filter the entire volume of the lake three times during this period.

The increase in water clarity may sound like a good thing, but it could have catastrophic consequences for those species of fish and native bivalves that rely on the food material in the water column. In addition, most of the material filtered out of the water by the zebra mussel is being packaged in mucous that is secreted from their gills. Balls of pseudofaeces are expelled through the siphons and fall to the lake bottom, covering, or rather smothering, the spawning grounds of fishes like the walleye.

Hopefully the current situation is the worst that can happen. Perhaps the zebra mussels themselves will eventually become spawning grounds for fishes. Perhaps water currents will continually flush the pseudofaeces off the spawning beds. Perhaps the zebra mussels will become fish food, and the fishes will increase in number. Most newly colonizing species explode in numbers during the first few years, then the population crashes. This cycle may repeat itself several times, but eventually the species reaches a population level that others, including people, can live with.

PHOTOGRAPHY COURTESY DR. JOSEPH LEACH, ONTARIO MINISTRY OF NATURAL RESOURCES

Everything solid is subject to an infestation of zebra mussels. This vehicle, dubbed the "mussel car," was in lake water for only a few months.

Portraits of Canada

Other countries have national portrait galleries. Why doesn't Canada?

Douglas Fetherling

After years, even decades of neglect if not disrepute, commissioned portraiture has been booming in Canada. The older generation, exemplified by Cleeve Horne, is still at work, but it coexists with a full complement of younger practitioners like Lynn Donoghue and Brenda Bury. There is also room for a painter such as Glenn Priestly who has kept alive some of the portrait techniques associated with the Renaissance

One of the most curious developments in recent Canadian art, though hardly one of the most surprising when you take time to think about it, has been the revival of interest in portrait painting (that genre of art, so John Singer Sargent remarked, in which there is something forever not quite right about the mouth). After years, even decades, of neglect if not disrepute, commissioned portraiture has been booming. What not that long ago was considered an artistic backwater, not always respectable from the artist's point of view, has now lost some of the stigma given it by generations of hacks supplying likenesses for hospital lobbies. But then it is in the nature of the trade that portraits are usually seen as mediocre when they are fresh but take on historical significance as the years progress.

In Toronto and other large Canadian cities a variety of professionals are kept quite busy these days. The older generation, exemplified by Cleeve Horne, is still at work, but it coexists with a full complement of younger practitioners such as Lynn Donoghue and Brenda Bury, who are clearly the present manifestation of a powerful historical momentum without being conscious adherents to the limner tradition. There is also room for a painter such as Glenn Priestly, a serious artist who happens to have chosen portraiture as his form, and who is widely regarded for the way he has kept alive some of the portrait techniques associated with the Renaissance.

"There's no doubt about it—it's becoming fashionable again, and not just here," says Danae Chambers, who has been accepting commissions in Toronto since the 1970s. Telford Fenton, who has been at it a couple of decades longer, agrees.

Douglas Fetherling is literary editor of the Kingston Whig-Standard

He cites "an economic pattern" that is now once again working to the portrait painter's advantage. Reviewers and art-watchers, no doubt noticing a new interest in the subject on the part of newspapers and the financial press, have been quick to recognize the change. Christopher Hume of the Toronto *Star* has observed how private commissions have begun to crowd out corporate ones as "people with no corporate connections whatsoever are opting to have their picture painted."

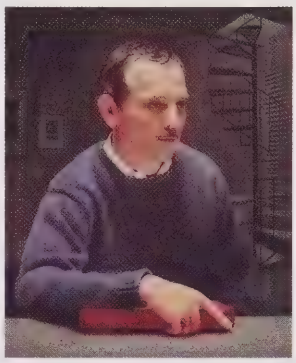
Some commercial galleries and even auction houses, the most conservative wing of the fine-art world, have noted the shift. "A few brave souls are beginning to collect Canadian portraits," says Jack Kerr-Wilson, the president of Phillips Ward-Price Ltd. This mimics the trend internationally. The *Sunday Times* has reported that over the past two years the sales of "undistinguished" eighteenth- and nineteenth-century portraits have quadrupled at the London sales-rooms of firms such as Sotheby's and Christie's, a development that to some extent must reflect a fashion in interior decoration. The Canadian situation, however, would seem to be more closely linked to other factors, including perhaps a corresponding disenchantment with portrait photography at the moment. Certainly it is one that is of course fully compatible with the famous documentary bias that always has been one of the broad characteristics of Canadian culture.

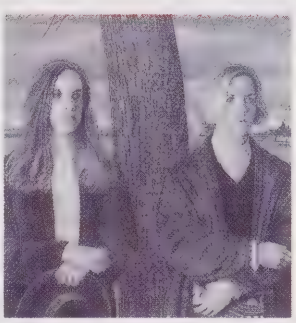
Like so many other art forms in Canada, Canadian portrait painting was slow to arrive and took a long time to find itself amid the conflicting British and American influences, only to take somewhat different directions in English Canada and French Canada. Only a small number of portraits were painted in New France during the *ancien régime* but many of the old families had brought portraits with them from France and so had planted the seed. As for the other colonies, immediately after the Conquest it was the custom for the leading citizens of Halifax to sit for their portraits in Boston—many were painted by John Singleton Copley no less—though soon it was far more common for portrait artists to come to their clients, rather than the other way around.

Beginning in the 1780s, painters would regularly cut a swath through the local establishments of Quebec and Nova Scotia. Some were skilled artists indeed: English, American, German, or Dutch and then, slowly but with increasing frequency, Canadians—albeit Canadians who had studied abroad. Many were talented painters about whom a good deal is known (see "Canadian Faces: Some Early Portraits" in *Rotunda* Spring 1978). Others were naive amateurs, sometimes sign painters stretching beyond the natural reach of their abilities.

The paintings that resulted might vary wildly in quality, but they had certain elements in common. The people who made them inevitably had to confront the question that has challenged portrait makers throughout the ages: how literally, if at all, to heed the kind of attitude exhibited by Oliver Cromwell when he instructed the painter Sir Peter Lely to show him warts-and-all ("roughnesses, pimples, warts and everything as you see me, otherwise I will never pay a farthing for it"). Gian

Portraits are invaluable for their hidden social histories and for keeping alive the images of persons long dead, to remind us what they looked like. The popularity of portraiture is fully compatible with the famous documentary bias that has always been one of the broad characteristics of Canadian culture. As with so many other Canadian art forms, portrait painting was slow to arrive and took a long time to find itself amid the conflicting British and American influences, only to take somewhat different directions in English Canada and French Canada





Portrait of Douglas Chambers, 1984,
by Glenn Priestly, oil on board.
Private collection, England.

My Father, 1989,
by Glenn Priestly, mixed media.
Collection of the artist.

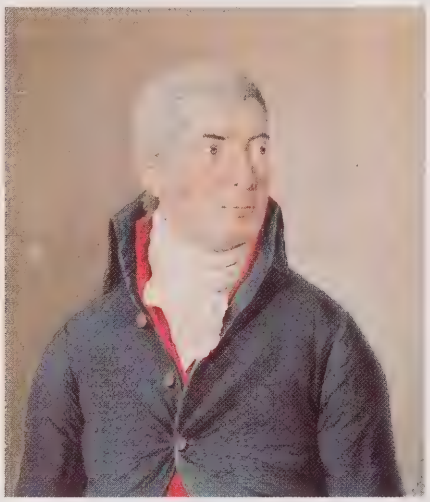
Portrait Study, 1989,
by Glenn Priestly, charcoal on paper.
Collection of the artist.

PHOTOGRAPHY BY THOMAS MOORE

Lorenzo Bernini, the seventeenth-century Italian painter, praised Michelangelo by observing that he "would never make portraits. He was a great man [but] he had more art than grace." The implication is that a portrait painter would do better if the ratio were reversed.

In the sort of family portraits so popular in England and Canada in the late eighteenth century one often sees people with rather big heads atop slender out-of-proportion bodies, stiffly posed with a kind of calculated candour; such figures look so remote and unlifelike to us that we might begin to doubt the artist's grasp of basic draughtsmanship. But the dogs sometimes shown in such portraits, and also in the hunting scenes popular at the same time, look absolutely contemporary to our eyes. Not only is there not the same fashion in dogs' bodies as in human ones, but the dogs didn't have to be flattered; they weren't paying the bill. An American colleague once told the French dealer René Gimpel that a portrait painter "who wants to be successful here must slim down the hips and fatten the pearls."

Only a small number of portraits were painted in New France during the *ancien régime* but many of the old families had brought portraits with them from France thereby planting the seed. English Canadians in Halifax first sat for their portraits in Boston; however, it soon became common for American painters such as John Singleton Copley to travel to their Canadian clients



Alexander McDonell (1762-1842), 1803, by William Berczy, watercolour. Collection of the Royal Ontario Museum.

McDonell was a prominent citizen and office holder in Toronto. In 1803 he was sheriff of the Home District and a member of the House of Assembly, representing Glengarry and Prescott.

None the less there is an enormous amount of value to be had from portraits of all types. There is the social history hidden away in them, for example. In the Renaissance when individual portraits came into their own not only as art works but as accurate likenesses, there was a fad for painting young ladies holding a small book, often a *duodecimo* volume. These could sometimes be read as advertising posters: prospective male viewers would observe that the subject was not merely attractive but virtuous as well. The fact that she knew how to read meant that she was educated, which suggested that she had been to a convent; virginity could therefore be presumed. And then there is the documentary nature of old portraits—their usefulness in keeping alive the images of persons long dead, of reminding us what they looked like. This function weaves in and out of the question of such pictures' artistic value.

In early Canada, there were certainly a few portrait painters such as William Berczy (the subject of a major exhibition to open at the National Gallery in autumn 1991) whose importance is beyond dispute. Most others are, so to speak, more part of art history than of art. Even an anonymous work of someone not particularly famous can still have significant value one way or another. The record price for an early Canadian portrait was set in April 1990 when the *Portrait of Marie-Melanie Quensel*, painted about 1810 by some unknown hand, was knocked down for $35,000 at Sotheby's in Toronto.

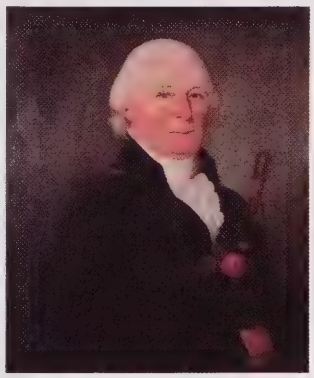
Generally speaking, in the first decades of the nineteenth century there were more itinerant journeyman painters in Lower Canada than in Upper Canada, which was more rural. Or one can say at least that the portrait tradition, having had an earlier start in French Canada, seemed to race ahead, and to throw up a number of remarkable figures. Starting in the 1780s, Louis Dulongpré of Montreal is thought to have painted 3000 portraits of one kind or another. Through successive generations of artists, such as Napoléon Bourassa (1827-1916), a distinct Quebec tradition emerged that is perhaps easier to

PHOTOGRAPHY COURTESY CANADIAN DECORATIVE ARTS DEPT., ROYAL ONTARIO MUSEUM

recognize than to analyze, except in allegorical terms. In fact, *allegorical* is one way to describe it. Robert Stacey, a Toronto art historian, points to the different ways in which the two cultures treated a subject common to both, Sir Wilfrid Laurier. "Alfred Laliberté and other [Quebec] artists tended to use a symbolist vocabulary in representations of him. They worked in heroic forms because that is how Quebec looks at its heroes. To English Canadian artists, he was less spiritual, more earthbound." Stacey was thinking here of portrait busts and other sculptural works, but the point applies equally well to painting.

Whereas William Berczy moved from York to Montreal in 1798 seeking a larger pool of noble heads to paint, the balance tipped in the next generation with painters such as William Sawyer (1820-89). He started out in Montreal but moved westward to Kingston and finally to Ottawa and to Toronto—wherever commercial growth and legislative power spelled bright prospects. One of the distinguishing features of such artists is that they in fact followed the seasonal path of wealth and power, much as early judges rode a regular circuit, hearing the accumulated cases in each town. There was even one husband-and-wife painter team, "Mr. and Mrs. Cook," who for a number of weeks in 1834, for example, worked in Kingston. According to the advertisement they took in a local newspaper, the *Chronicle and Gazette*, they could be found "at Mrs. Bayman's on Quarry Street" and their work inspected at the Commercial Hotel nearby. Little if anything is known about the wife but the male partner was Nelson Cook (1817-92), an American, like so many of the travelling portrait painters of the day. Another, Ezekiel Sexton, would come up from New York State in the 1840s seeking commissions in Toronto and as far afield as the town of London. But in time Toronto at least could support a few such artists of its own.

Eventually Canadians, who had studied abroad, joined the ranks of itinerant painters. In the first decades of the nineteenth century there were more painters working in Lower Canada than in the more rural Upper Canada. Of these artists, the importance of William Berczy is beyond dispute. A distinct portrait tradition emerged in Quebec, starting with Louis Dulongpré of Montreal in the 1780s, who is thought to have painted 3000 portraits of one kind or another



James Sinclair of Three Rivers, 1808, by Louis Dulongpré, oil on canvas. Collection of the Royal Ontario Museum.

Perhaps the first important one was Theodore George Berthon (1806-92), who began working his way through the local establishment when he was in his mid-30s. He was an Austrian-born Frenchman whose father had been one of Napoléon's court painters. It was not until the last quarter of the nineteenth century that two native-born Canadian portrait painters filled the same role and came to enjoy a considerable degree of prestige in their own right. The first was J. W. L. Forster (1850-1938), who also painted historical figures such as Wolfe and Simcoe but is best known for his portraits of politicians and capitalists as well as of some scientific and artistic figures. He reminisced about many of his famous subjects in his memoirs *Under the Studio Light: Leaves from a Portrait Painter's Sketch Book* (Macmillan of Canada, 1928). He wrote another book as well, published posthumously, that discussed the craft itself: *Sight and Insight* (Oxford University Press, 1941).

The other full-time Canadian society painter was Edmund Wyly Grier (1862-1957), whom Augustus Bridle, that piquant commentator on Canadian life, called "a master at the art of gentlemanly agreement and of precise expression," qualities every portrait painter needs. He was a prolific painter of the financiers who rose on the boom of the 1920s and the cultural figures who rode the concurrent wave of national feeling. So much so, in fact, that even today one stumbles on previously little-known Griers in boardrooms, libraries, and dens. When

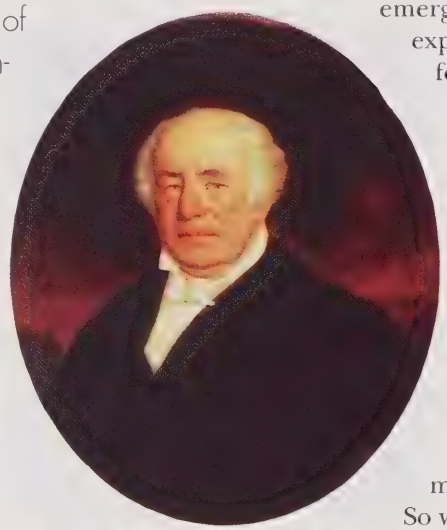
PHOTOGRAPHY COURTESY CANADIAN DECORATIVE ARTS DEPT., ROYAL ONTARIO MUSEUM

Whereas Berczy moved from York to Montreal in 1798 seeking a larger pool of noble heads to paint, the balance tipped in the next generation as artists such as William Sawyer moved from Montreal to the rapidly growing commercial and political centre of Toronto. Yet another generation later, in the last quarter of the nineteenth century, J. W. L. Forster became one of Toronto's first established native-born Canadian society painters

in 1935 Canadians again became eligible for titles in the King's birthday honours list, he was one of the people knighted (along with the poet Charles G. D. Roberts, for example).

Significantly, both Forster and Grier flourished in the age when professional portrait photography had usurped some of the purely documentary function of portrait painting but had not yet been eclipsed by amateur picture-taking. When photography first became popular, many painters at least dabbled in the new technology commercially. The painter William Valentine (1798-1849) opened the first daguerreotype studio in Halifax, for example, and William Sawyer found he had to photograph as well as paint people, to say nothing of teaching and even undertaking restoration work. Forster and Grier and the rest of their generation were different. Portrait painting had long since recovered from the threat of photography to emerge as a quite distinct, more dignified, and more expensive undertaking for people wishing to see their features immortalized. One might almost say that photography was necessary before portrait painting could achieve its full stature as a wonderfully arcane, at times almost occult, science.

Forster was most definitely not one of those painters who would undertake a portrait only when he needed money to support some other less commercial type of art. Nor was he a portrait hack, devoting himself solely to grinding out pictures, one after another, without regard for the complexities of his sitters' personalities or the formal possibilities of the picture. He was a portrait artist first and last, interested in the betterment of his honourable but often maligned calling. So when he died, he left a will calling for the establishment of a national portrait gallery. To get it going, he bequeathed the sum of $10,000 as well as a collection of his own works—portraits of famous Canadians such as Alexander Graham Bell the inventor, Emily Murphy the feminist, and Vilhjalmur Stefansson the polar explorer. A charter was duly issued and directors appointed, but the Second World War intervened before other fundraising could begin, and the project never quite recovered its momentum. By 1955, the directors were lending the paintings to schools and libraries because they had nowhere to put them.



Dr. James Graham (1782-1854), 1851, by William Sawyer, oil on canvas. Collection of the National Portrait Gallery.

Dr. Graham was one of the few medical practitioners in the Port Dover area, where he settled after the War of 1812.

PHOTOGRAPHY COURTESY CANADIAN DECORATIVE ARTS DEPT., ROYAL ONTARIO MUSEUM

So little known was this story that in 1965 a researcher working on the Art Gallery of Ontario's catalogue of its Canadian collection went to great lengths to uncover information about the whereabouts of two Canadian portraits that interested her. As the story is revealed in the correspondence files of the AGO, she was surprised to find that, when they were reproduced in a book in 1946, the portraits had carried the credit line "Canadian Portrait Gallery, Toronto"—an institution of which she had never heard (because, as a physical place, the institution did not exist). She tracked down descendants of the sitters and finally the president of the National Portrait Gallery board, who also happened to be Ontario's provincial secretary. He was "eager to do something about this intended portrait collection," the cataloguer reported back to the family of the people in the paintings, "but I understand the corporation lacks sufficent funds to enable it to stand on its own [and] no

one who has been approached has shown enough interest to dedicate the necessary time and effort to assist in firmly establishing such a collection."

Yet there was never a complete cessation of promising activity. By the 1960s, the Forster collection was in storage at the Ontario Archives but its fate was not entirely certain. Then, through the intervention of Helena Ignatieff, it was at least given permanent sanctuary by the ROM in 1969. "But in practical terms," says Mary Allodi, art historian and ROM curator of Canadian decorative arts, "this consisted of switching it from one vault to another."

There was another reawakening of interest in Forster's dream during the mid-1970s, sparked by controversy over the fate of his former residence on Wellesley Street East, opposite the old Paul Kane House. Meanwhile the original Forster collection (15 oil portraits) had been augmented by a number of interesting gifts-in-kind. Although it still has no building of its own, for the past five years part of the collection has been on exhibition in the Canadiana galleries of the ROM's main building. The Public Archives of Canada, as the National Archives was then known, believed that it should take over the pictures, for it has about 500 Canadian portrait likenesses of different kinds, which it collects for their documentary relevance alone. But it has little or no exhibition space specifically for paintings. Various other proposals were discussed, including the establishment of a national gallery in Kingston, equidistant between Toronto and Montreal and so rich in historical associations.

But it was apparent long ago that what such plans may yet come down to is not a museum, with a large number of portraits gathered in one place, but an image and information bank, a sort of central registry and clearing house for Canadian portraiture, open to students, researchers, historians, and the interested public.

As long ago as 1965, the National Portrait Gallery directors thought of compiling "an index of portraits of eminent Canadians" in various collections. They went so far as to retain a curator from the Montreal Museum of Fine Arts to "do a survey as to the feasibility and cost of an index." The study showed the work would take two years and require $40,000, a sum the board was unsuccessful in raising.

In the early 1980s, Mary Allodi spent some months working on such an index, gathering information and photographs of portraits in unpublished public collections and in private collections. However, she soon realized that this would be an endless project unless it was staffed with information gatherers and coordinated into a central computer with a specific portrait program. Just as funding would be necessary for a national portrait gallery exhibition space, it would also be needed to create a workable national portrait index.

Video technology has advanced to the point where it is beginning to be used for the retrieval of images of art works. A generation ago, André Malraux in France coined the phrase *musée imaginaire.* He used it to mean the role of art in a nation's or a society's collective consciousness. In a less literary sense, it could also be applied to what the field of Canadian portraiture is crying out to see created.

When Forster died he left a will calling for the establishment of a national portrait gallery and a bequest of $10,000. Canadians still do not have such a gallery. They may end up, through video technology, with a national portrait index. André Malraux coined the phrase *musée imaginaire* to describe the role of art in a nation's or a society's collective consciousness. In a less literary sense Canadian portraiture is crying out for such a creation

Self-Portrait, by J. W. L. Forster (1850-1938), oil on canvas. Collection of the National Portrait Gallery.

Emma Frances Forster (1853-1951), by her husband J. W. L. Forster, oil on canvas. Collection of the National Portrait Gallery.

PHOTOGRAPHY COURTESY CANADIAN DECORATIVE ARTS DEPT., ROYAL ONTARIO MUSEUM

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Wildlife Art: Communicating an Essential Vision

Although some wildlife artists and scientists may view the natural world from different perspectives, their visions prove to be complimentary

David Barr

I first met George McLean more than thirty years ago, when we were both boys with the gleam of nature in our eyes. We were working, at the time, for a biological supply house and spent our days preparing specimens for study in Ontario schools.

But during our evenings and weekends we pursued the lure of the natural world in the ways that were to mark the next three decades of our separate careers. I wanted to understand the world as a natural scientist, in terms of measurements, counts, classifications, and theories. McLean wanted to understand nature through the eyes, the emotions, and the heart—he was becoming a specialist, not in just looking at nature, but in truly seeing it. And McLean had begun, even then, to turn his visions of nature into images—drawings, sketches, and paintings—that would carry his own special message to others.

The animals around where I live are the animals I know the best and the landscape is the landscape I know the best. I think I can paint them that much better because I have that much more experience with them

George McLean

Animals have always been an important part of human experience. Their images were created on rock surfaces by palaeolithic artists more than 15,000 years ago. Throughout the ages and around the world, artists have frequently depicted animals in their work, often in stylized and symbolic forms. In our own age, as people are becoming aware of and disturbed by the rapid disappearance of the natural world, they find images of animals in art deeply moving.

Seeing nature and communicating that vision has also been the lifetime obsession of sculptor Ken Bunn and painter Bob Kuhn. Bunn,

PHOTOGRAPHY COURTESY GEORGE MCLEAN

David Barr is curator in charge of the Department of Invertebrate Zoology, Royal Ontario Museum, and curator of the Museum's special exhibition Wildlife: Images in Painting and Sculpture

PHOTOGRAPHY COURTESY DAVID BARR

Cougar Reclining in Tree, *by George McLean, casein, 124.5 cm x 55.9 cm*

Kuhn, and McLean are among the finest artists to carry on the tradition of depicting wildlife, and they do it in a special way, with a consummate skill that speaks volumes to their audience. They are successful because they stimulate the viewers' memories and impress them with the reality of their images.

My own experience of observing nature moved into high gear when I began to study and describe the structures of invertebrate animals. Before long I had to draw these structures, photograph them, and work with professional scientific illustrators so that others could see the structures as well. I soon learned that lines on paper could capture what no camera could.

The camera and the scientific view of the natural world have many strengths, but at the same time they are systematic, literal, and uncompromisingly comprehensive, a combination which does not correspond to the average person's way of viewing the world.

Often I create the sculpture so that the rear end of the body is posed as it would have been four or five seconds before the pose depicted in the front end. Not exactly scientifically accurate, but it conveys a tremendous sense of motion

KEN BUNN

McLean, Bunn, and Kuhn do not have this weakness in their art. To appreciate how they depict the world, I need only think of how I look at nature myself when, in leisure moments, I'm not being scientific about it. I focus on only a small portion of all there is to see at one time. My eyes stop here and there, soaking in details, and then flit on to something new. Now in the foreground, now farther away; to the left and then to the right. My focus is very specific, selective, and idiosyncratic; it's guided only by personal choice.

When I'm outdoors, vision is only part of the sensory impressions being stored away. Whether conscious of it or not, I'm also sensitive to the humidity in the air and the colour of the light from the setting sun or through the filter of a lowering sky. There's the stillness before the storm, the crisp air at dawn. I'm made sharply aware of this fact when years later, a smell or a sound or a trick of light can bring back a whole natural scene from memory.

My personal vision of the natural world is a patchwork quilt of vignettes and impressions, stitched together by the brain, the edges made smooth and seamless by the vagaries of memory. The things that make the most lasting impression are the most outstanding, the most characteristic, the most memorable moments. The complexity, the detail, and the confusion of what has been observed become distilled and simplified into the strong, clear memories and impressions that last and shape opinions and behaviour.

Looking at animals and remembering what one sees requires skill. Kuhn speaks about the pet fox that he once had. "I looked at it every day for months. I've always remembered the advice of an older artist—always look at an animal like you may never see it again."

PHOTOGRAPHY COURTESY KEN BUNN

McLean walks "three or four miles a day, and a lot of the walk is near my own home. The animals around where I live are the animals I know the best and the landscape is the landscape I know the best. I think I can paint them that much better because I have that much more experience with them."

PHOTOGRAPHY COURTESY DAVID BARR

***One Last Look**, 1983,*
by Ken Bunn,
bronze,
40.6 cm x 66 cm x 30.5 cm

That inner vision the artists are building by observation is crucial to the creation of their images. In fact the image is an expression of the vision. When looking at film, photographs, paintings, or sculptures depicting nature, people compare the artists' images to their own visions. When there is a good match between the artistic image and the public vision, the public is struck and moved by the reality of the artistic image. This is not a scientific reality; it's a human, individual one.

Wildlife artists work at building their personal memory pictures of the natural world. Ken Bunn tells of watching a small group of burros for an afternoon while he fashioned a pile of clay. "They were constantly moving, and I had to bring out a few carrots to keep them coming back, close enough to watch. A mother stood with her baby for a

moment in an attitude of parental care, protecting its back with her head. I captured the attitude in clay, but had to keep watching for hours to fill in the detail; and every once in a while they would strike the same characteristic pose."

As Bob Kuhn tells it, "You have to paint what you see and what you

Flat Out, *1985, by Bob Kuhn, acrylic on canvas, 36.8 cm x 47 cm*

know. When you paint, you're letting a lot of people in on your little secrets. I have seen a lot of things about these animals that you haven't seen. And I want to show them to you."

George McLean makes the point graphically: "As a jumping cat lands, in most of the stages of its motion, its body looks like a big sack of potatoes. Those stages are unusable visually. Although the whole flow of motion is graceful to the eye, only certain instants in the animal's behaviour communicate the grace of the entire action." And those instants are what the artist sees and must portray.

The best animal art blends a lifetime of observations, of emotions, of sensory impressions into a deeply personal visual communication. The most powerful art may transcend the medium. Of Bob Kuhn's paintings of Africa, author Tom Davis has written, "You can almost taste the dust in the air, smell the musk of animals, hear the hollow grunts and the syncopation of hooves."

George McLean states: "I always wanted to paint animals the way I feel about them. It's the only reason I have for painting them. It's a need I have. I'd do it for free if I could afford to."

Too many contemporary wildlife artists operate with an objective that is quite different. Like the camera, they strive to copy every detail

PHOTOGRAPHY COURTESY DAVID BARR

of every hair and every feather with microscopic fidelity. Like the scientist they labour with textbooks, field guides, and anatomical drawings until they have reproduced every physical detail of their specimen, and sometimes of its environment as well. Some of these artists even use a photographic slide projected onto the drawing board to lay out and fill in every detail of the scene. But when I look at one of these hyper-realistic images, I find it flat, bland, and unconvincing. The rich reality of the living animal has been shrunk to two dimensions. It's at variance with my own internal image. It rings untrue. Escaping the trap of literal realism, more properly the realm of the scientific illustrator, is the self-appointed task of McLean, Bunn, and Kuhn.

You have to paint what you see and what you know. When you paint, you're letting a lot of people in on your little secrets. I have seen a lot of things about these animals that you haven't seen. And I want to show them to you

Bob Kuhn

In his sculptures, Ken Bunn always "tries to build in some design that gives a sense of motion." He's never aiming "just to make a nice model of an animal." Bunn works with each piece, changing the attitude of the head, the thrust of the forequarters, the tension of the legs, until the result matches his inner vision of the animal in motion.

George McLean suggests that his vignette compositions impose the greatest discipline. "Every line and shape is critical to the composition. Every twig and blade of grass is carefully selected for a reason, and all the natural detail that does not contribute is rejected. The artist has to take some liberties with an animal that a scientist can not, in the interest of making it visually *right.*"

McLean, Bunn, and Kuhn may agree on what wildlife art should express; however, each artist has his own very individual style and approach to his subjects.

Bob Kuhn is a sage and knowledgeable veteran of his art, with a sprightly wit and a passel of animal stories. He spends countless hours searching for the representative gesture. "What I do a lot is just sit around making little gesture sketches. Ninety-eight per cent of them are no good; every once in a while I get one that works. Once you've got the gesture and the general concept, all that is left is to use the environment to fill in the background." Kuhn calls what he is looking for poetic poses. "In some paintings, the gesture is the whole picture; it's silly to put anything else in but tone."

And he doesn't hesitate to manipulate events to tell more about nature than one could actually see at one time. He says that he's "not a great stickler for timing; I can delay or accelerate an action in order to get the elements that I want."

Kuhn even extends his search for characteristic behaviour patterns to whole groups of animals at once. "In painting a herd of elephants, what I wanted to show was how they moved, like one big mass; a pod of animals with lots of legs, like a big bug."

Ken Bunn is a tall, laid-back westerner, with a slow drawl and an ironic sense of humour. He spends long hours in his sculptor's studio but often leaves to refresh those internal stores of sensory memories. Whether it is off to the zoo for a few hours, following wildlife for a day or two through the canyons of the Colorado Rockies, or embarked on a several-week African safari, he carries his sketchbook and even a few handfuls of clay or plasticine.

Bunn's work is especially noteworthy for an almost magic ability to present the viewer with an instant, frozen in time, while simultaneously capturing those characteristic gestures that convey the very essence of his subjects with a sense of motion through time before and after that instant. "So much of what I believe is important in sculpture," says Bunn, "consists of showing the intent without necessarily showing the

PHOTOGRAPHY COURTESY BOB KUHN

result. It's what I call the implied action." He goes on to say,

I always try to remember that the different parts of an animal's body are going through different parts of an action at the same time. So while the forequarters of a bounding doe are flashing with action, muscles bulging, the hind legs are tucked up beneath the body, almost motionless, the muscles slack, poised for the next thrust of energy.

Often I create the sculpture so that the rear end of the body is posed as it would have been four or five seconds before the pose depicted in the front end. Not exactly scientifically accurate, but it conveys a tremendous sense of motion.

And it tells so much more of a story than would a high-speed photograph that merely freezes all of the body at the same instant in time.

Bunn also uses another technique for showing the passage of time. In his sculpture of four Dall rams, entitled *One Last Look*, he describes how he shows a sequence of action. "After being startled, one ram has already started to take off. Two others are in various stages of getting under way. The fourth is poised for flight, but still looking back, inquisitively, to see what startled them." With the rams displaying different stages of the single action of fleeing, Bunn shows simultaneously the entire sequence of movements that each ram will take.

When a personal artistic vision closely matches the public vision of wildlife, the public is emotionally triggered to action. An artistic image has the same or greater impact as written or spoken scientific fact. And, in the long run, only public reaction can save our natural world

Today George McLean is a burly, emphatic, passionate, and sometimes brooding individual. He is also a strong proponent of the importance of the dramatic and representative gesture in wildlife art, and like the others brings a lifetime of observation to his art. But even more than the others, McLean has developed an intimate involvement with the survival of the natural world, the world that has sustained his emotional life and formed the unvarying subject of his paintings. Because McLean knows that every wild animal can survive only when supported by its environment, he has also become a committed environmentalist.

But environmental awareness is not the master of his art. "I want to make it absolutely clear," says McLean, "that my paintings are not about conservation. They are paintings for the sake of painting." Instead, environmentalism is an outgrowth of a career that has shown a fascination with the habitat that helps to define an animal's individuality. In his own words McLean says,

One of the ways I work is to see certain lighting effects in a landscape, which generates an idea that I could show a particular animal in that landscape. Certain landscapes suggest certain animals. There are no hard rules, but I can't imagine painting a great horned owl in a field of daisies. That doesn't convey my feeling of what the great horned owl's personality is all about. I think I might paint a meadow lark in a situation like that. I like to put the animals in a setting that I think adds to their character, to their personality.

By any account the creativity of these artists is an intensely personal process. The photographer may ask, "What is that animal doing?" and the scientist may ask, "Why is the animal doing that? What is it for?" Both are valid ways of understanding the natural world in an attempt to learn enough to save it. However, McLean, Bunn, and Kuhn ask none of these questions. For these artists it is important that the physical features and the behaviour portrayed are characteristic of the animal, and that the work of art is pleasing to the eye. And their approach reaches our emotions and reminds us that we have a bond with these wild creatures. Wildlife artists can move us to decision and to action. That's the only way our natural world can be saved.

The exhibition Wildlife: Images in Painting and Sculpture *will be on display at the Royal Ontario Museum from 21 November 1990 to 24 March 1991.*

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THE SAMUEL EUROPEAN GALLERIES OF THE ROYAL ONTARIO MUSEUM

The dazzling treasures of the Lee of Fareham collection first catch the eye of visitors as they enter the rotunda of the Samuel European Galleries. Then the collection of arms and armour comes into view.

SANDRA SHAUL
PHOTOGRAPHY BY KEVIN KELLY

GOOD GALLERIES ARE LIKE GOOD books. At one level you can step back and look at the whole story. At another level you can focus on one theme. At still another level you can learn more about one character or, in the case of a gallery, one artifact. After a year of visiting the Samuel European Galleries, which were built as a result of the generosity of the Samuel family, I still discover things that I missed before, see things from new perspectives, and always know that no matter how short a time I have to spend, there is a way in which I can enjoy the experience.

For the longest time it was difficult to get past the Lee of Fareham collection, the first gallery display beyond the entrance rotunda. Maybe it was because the dazzling array of gold, silver, and jewels in an intimate alcove was more inviting than the dark and apparently immense galleries that followed.

Then the armour caught my eye, and as I went to take a peek

Sandra Shaul is executive editor of Rotunda *magazine*

at these companions from my childhood visits to the ROM, the gallery pattern emerged. Each large display is divided into small-

of decorative art dating from the Middle Ages to the present.

The Samuel European Galleries' displays blend domestic

Tournament helmet, south German, perhaps Landshut, c. 1540-1550. The helmet is pierced with larger holes on the right side so that the wearer can breath. This is a feature of jousting helmets.

er units, contained in comfortable niches that give visitors a sense of security combined with a burning curiosity to know what's around the next corner. It's that pattern which makes it enjoyable to wander through 1173 square metres of gallery space and possible to grasp the story of Western European culture as expressed through more than 2000 pieces

and fine arts, a broadly representative approach rarely seen in North American museums. Not only does this give a fuller picture of the objects from a given historical period; it also allows viewers to come to their own conclusions about the differences between fine art and common object, about the quality of the objects, and about the effect of changes

in lifestyle and technology on the development of material culture over the centuries.

Perhaps another reason why the Lee of Fareham display leaves such a strong impression is that in contrast to the others, it is also the expression of the very idiosyncratic interests and tastes of an individual collector. Arthur Hamilton Lee of Fareham was chairman of the Board of the National Gallery in London and a cabinet minister in Britain during World War I. More than 200 gold and silver pieces from his collection are on permanent loan to the Museum from the Massey Foundation.

There are beautiful chalices and other religious works. A Giac book of hours is shown in its own case. The secular pieces are as elegant as the sacred and sometimes even more so. The 30-piece silver-gilt dressing table set made in 1735, in Augsburg, Germany is overwhelming.

New Materials: Plastic is one of the displays in Culture and Context. As the range of objects shows, plastic is certainly one of the most versatile materials ever created.

Yet it is the small pieces that are the most fascinating, for it requires very careful scrutiny to see their intricate detail and the extraordinary workmanship of their creators. A small golden statue of the goddess Diana on a stag, made in Germany about 1600, is in fact a wine jug; the stag's head is the stopper. There are rings dating from the Renaissance, including one with a compartment that opens to reveal a tiny figure. And as the perfect decorative expression of the Renaissance spirit of discovery, there are goblets made from ostrich eggs and coconuts, some of the exotic finds brought back from voyages of exploration. In the words of Corey Keeble, associate curator in the European Department, these goblets are "perfect symbols of European exploration and exploration beyond European shores. They are like a microcosm of the ROM in their combination of art

Garland on a muslin ground, glass paperweight, French, Clichy, 1845-55. Gift of Mrs. Alice B. Hall. Unlike the industrial techniques used to make objects from plastic, intricate glass paperweights are made by hand.

and natural history."

Combat and sports implements and apparel, range in date from medieval to modern times,

Presentation casket, steel, gilt brass, and Siberian malachite, Russian, Tula, early 1800s. Gift of Morton Shulman and Sidney Bossin. Such exquisite ornamentation is not only found on gift cases. Guns made in Tula are equally ornate.

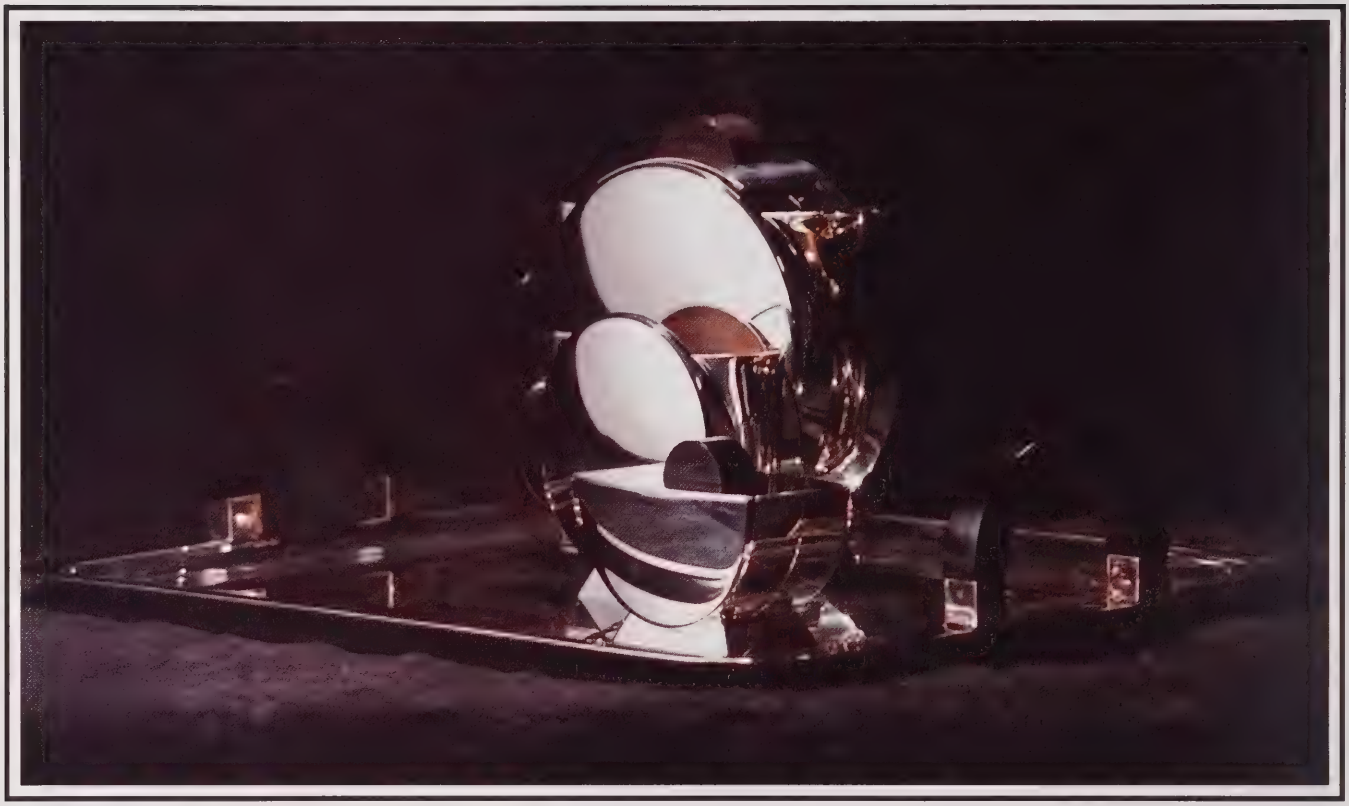
and in provenance from the battlefield and the jousting field to the hockey arena. Yet it is my love of ornamentation and gadgetry rather than the romance of battle or sport that has always made the Museum's arms and armour very special. An English presentation sword (1830-31) with gilded silver figurative relief decoration is a masterpiece of goldsmithing. An exquisite presentation box and an equally handsome revolving flintlock were crafted in Tula, Russia. The gun predates the Colt revolver by 40 to 50 years.

Renaissance arms and armour, with their ornate decoration and inventive technology, represent that period's ideal of invention for invention's sake.

Some of the arms and armour connect the European exhibits to those in other areas of the Museum. Swords dating from 400 to 1100, including one of the finest examples of a Viking sword in North America, follow the earlier Celtic weapons in the Greek and Roman World galleries. (Sigmund Samuel, one of Canada's most outstanding philanthropists, donated the Viking sword to the Museum.) Four swords with Islamic writing were part of the arsenal at Alexandria; such treasures are rarely found outside Istanbul. And speaking of rare treasures, there is the garniture (suit of armour) from the Royal Workshop at Greenwich, one of only three still in existence.

The integration of costumes and textiles through changing exhibitions is one of the innovations in the Samuel European Galleries. Formerly, textiles of all countries and eras were grouped in separate galleries. Another innovation is a gallery for temporary exhibitions based on the collections as a whole. To date these have focused on acquisitions: a display of objects collected from the time the original galleries closed in 1979 until the opening of the new galleries ten years later; psychedelic posters; and a selection from the very extensive Bernard and Sylvia Ostry donation of silver, furniture, and

ceramics which is now on display. These changing exhibitions mean that there is often something completely new to see in the galleries, and they also provide the perfect excuse to revisit daica gallery, which has rotating displays of objects from the Beth Tzedec Reuben and Helene Dennis Museum in Toronto, the Jewish Museum in New York, and various private collections. After



Tea or coffee service, silver plate with ebony handles, Barrel or "Tonnelet" model, designed c. 1935, produced 1987, by Christofle Silversmiths, Paris. High quality tea services such as this Art Deco set are always considered prestigous possessions for the home.

Outstanding Renaissance bronzes are found in the Metalwork gallery.

and to reconsider the permanent displays.

In Europe as in the Middle East, the design of Jewish material culture has been greatly influenced and shaped by the predominant culture of the country in which the objects were made. This can be clearly seen in the Ju-

looking at the Judaica gallery displays, it's always interesting to climb one more floor of the Museum to the West Asian galleries in order to see Jewish material culture in its Middle Eastern context.

Charles Trick Currelly, an archaeologist and first director of the ROM, was always interested in studying artifacts as they relate to their original context, and in keeping with Currelly's example and the trend in the ROM and many other museums today, the curators of the European Department are always looking for innovative and imaginative ways to think about Western culture. According to Peter Kaellgren, assistant curator in charge of the European Department, "In a multicultural society we have to stand back and look at Western culture from a more detached an-

thropological viewpoint."

Culture in Context is the name given to several small displays of period rooms and changing historical theme displays. The choice of period rooms and historical themes, which offer very focused displays of the changes in material culture and lifestyle from medieval times to the present, was based on the strongest areas of the European collections and the best ways to integrate them. With its emphasis on domestic objects, the ROM's medieval and Tudor holdings are among the finest outside England, and the Victorian holdings are the envy of many North American institutions.

German coconut cup, 1530-40. Lee of Fareham collection. The combination of a coconut, an exotic find brought back from a voyage of exploration, with superb decorative metalwork is a fine expression of the Renaissance spirit of discovery.

Torah finial, silver with French hallmarks, dated 1811, Italian, possibly Genoa. On loan from the Beth Tzedec Reuben and Helene Dennis Museum. Torah finials are used to protect and decorate the ends of Torah scrolls. As is common with Judaica, the design of this object shows the influence of the dominant culture of the country in which it was made.

The period settings—a late medieval urban room from about 1500, an English formal room from the 1750s, and a Victorian parlour from about 1860-85 are a complement to similar exhibits in the Canadiana galleries in the main building and the Sigmund Samuel Building. One of the more delightful features of the English formal room is a *trompe*

l'oeil floor cloth that looks like a black-and-white-checkered marble floor. This floor cloth, which was made specially for the room setting in 1989, reproduces the type of floor cloth actually made in the eighteenth century.

Displays of *Hygiene and Sanitation, Pleasures and Pastimes*, and *Tea for Europeans* bring together the domestic and decorative arts through very popular themes, especially in the form of the most beautiful toilet bowl that I have ever seen. In the *Eighteenth-Century Woman* exhibit I learned that it was not until the late eighteenth century in England that the distinct identity of women was acknowledged. Before that time everything for women, including the decor for their homes, was designed and acquired for them by men.

Just beyond and above the Metalwork gallery, a large porcelain and silver Sèvres urn sits in its own niche.

However, it is the case full of royal souvenirs that is the most entertaining. From objects of kitsch to a most dignified glass used to toast the health of the Monarch in the 1700s, the sentiment of loyalty is shown to cut across every class and to endure over the centuries. It is unusual for a display of objects to convey such a shared sentiment and sense of values.

And when it comes to cutting across the classes and the distinctions between fine and decorative arts or elite and mass culture, what has been more effective in the twentieth century than the use of plastic and other industrial materials with industrial techniques to make everything from Flintstone ice-cube trays to chairs designed by Marcel Breuer? The theme displays on this subject are wonderfully juxtaposed with a case showing how cutlery has changed over the centuries.

Beyond the *Culture and Context* exhibits is the Metalwork gallery with cases of silver, pewter, and the finest collection of small

Diana on a stag, silver, partly gilded and jewelled, south German, Augsburg, by Matthias Walbaum, c.1600. Lee of Fareham collection. The stag's head is removable; its body is a wine jug. A clockwork mechanism and wheels make the figure move in a programed pattern.

Detail of decoration for a dessert table of the late 1700s, English porcelain bisque. On temporary display in the Current Research case outside the ceramic and glass study galleries.

bronze Renaissance sculpture in Canada. It is obvious from the similarities in the silver and pewter objects that pewter was once considered the poor man's silver. Except for the great difference in cost between the two materials, a modern eye would hardly make such a judgement. One of the most captivating displays is the collection of English miniature silver. Although it is a treat to behold, it also serves the more practical purpose of providing extensive documentation of the appearance of the full-scale originals at a time when originals are no longer available or are too costly.

It's important to look up when leaving the Metalwork gallery. There is a magnificent porcelain and silver Sèvres urn in its own niche, which is thought to have been a gift from Napoléon III to Baron Haussman, the architect who designed the wide avenues of Paris.

The final galleries are two welcoming spaces that contain study collections of hundreds of pieces of ceramics and glass, the areas that have been most popular over the years for research and teaching. There is an incredible variety of techniques and products. I'm particularly fond of the glass paperweights, most of which have been given as gifts to the Museum. And while the great ceramic "stars" are shown at the Gardiner Museum, the selection in the study collection is intriguing and amusing in its own way—like the simple bowl decorated with a drawing of women picking their men from trees.

Charles Currelly wanted the Museum to show "the arts of man through all the years." The Samuel European Galleries are certainly doing their share towards achieving this goal. Through donations and purchases, the collections of European objects from past centuries will continue to be enhanced, and those of the twentieth century expanded to represent more accurately the international culture which draws Europe and North America together. The task of the Samuel European Galleries will be to convey the vitality of the collections to a public still eager to discover and learn.

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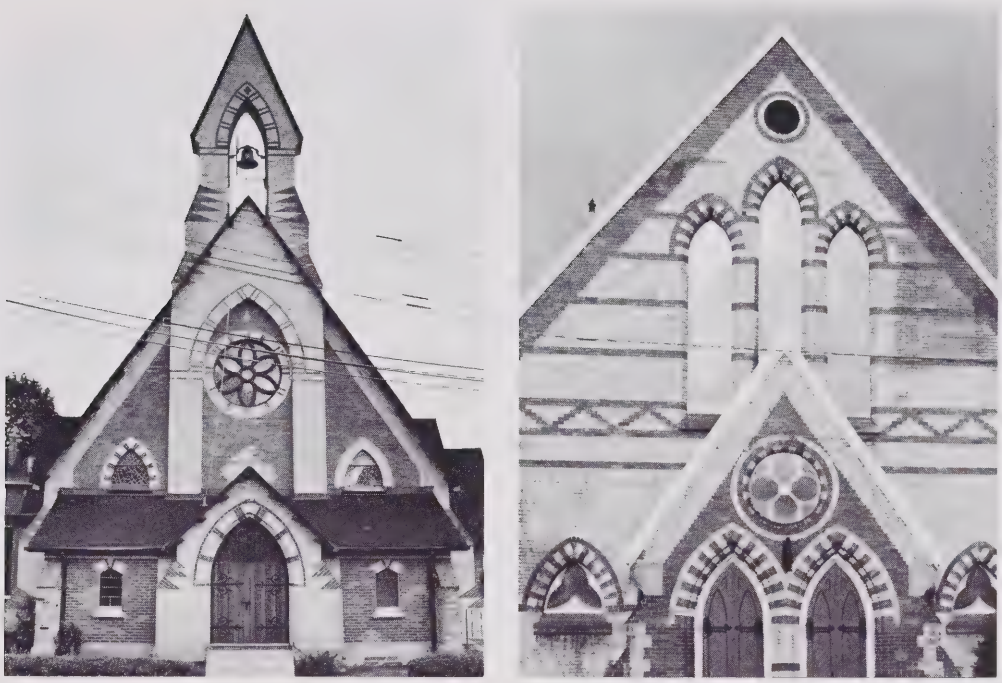

From certain perspectives St. Peter's Church (left) looks as if it is a red brick church with lavish yellow brick trim; from others, like a yellow brick church with an emphatic red trim. All Saints Anglican Church (right) is decidedly a yellow brick church, decorated more extravagantly than St. Peter's with red brick.

The Building Blocks of Ontario

"HORRID WHITE BRICK," OSCAR Wilde sniffed when he saw Toronto in 1882, "with its shallow colour spoiling the effect of the architecture." Wilde, his reputation as yet unsullied by scandal, was lecturing Torontonians on " The Decorative Arts" and "The House Beautiful," so his opinion was not without weight. But, for those who agreed with him, his pronouncement came too late. Although their commitment was waning by the 1880s, southwestern Ontarians had enjoyed a fairly steady flirtation with buff yellow brick (technically known as white brick) that had lasted most of the century. The resulting houses, churches, and commercial buildings—subtle and restrained when totally yellow, or assertive to the point of flamboyance when decorated with red brick—are among the most characteristic sights of Ontario towns and villages.

The use of yellow brick for houses in the nineteenth century was often a matter of geographic and economic necessity. Ontario builders never shared the Americans' affection for wood, and a series of disastrous fires in London and Toronto in the first half of the century confirmed their belief in brick. (Even "yellow brick Ontario," the area south and west of Ottawa, has an occasional stone town, such as St. Marys, but stone and skilled masons did not often coexist in nineteenth-century Ontario.) As early as 1796, the city fathers of York chose brick for their first legislative buildings, at the foot of Berkeley Street. In 1816, Ezra and Nathan Griffiths were operating a brickyard in London, where they traded a chimney's worth of bricks for a cow.

Those early brickyards were tiny enterprises, where clay was mixed with water by teams of oxen, pressed into moulds, dried in the sun, and finally fired in kilns. For many of those brickyards, the local clay was Erie clay; a Bureau of Mines report in 1906 claimed that western Ontario was covered by "a mantle" of Erie clay that ranged in depth from 0.3 metres to at least 39 metres. Formed in the lakes of the glacial period, Erie clay was often found in deep banks "of a stiff, tough nature." Most important for the look of Ontario, bricks made from it emerged from the kiln a subdued yellow.

Erie clay also produced red bricks, but only from the top layer of clay, when it was exposed to the

PHOTOGRAPHY BY CHRISTOPHER VARLEY

surface. As Nancy Tausky and Lynne DiStephano explain in *Victorian Architecture in London and Southwestern Ontario* (University of Toronto Press, 1986), the proportions of lime and iron in a clay determine the colour of the bricks made from it. When rain and snow wash away the lime in an exposed patch of Erie clay, the iron remains; the bricks made from Upper Erie clay, or red-top clay, are red.

The abundant amount of yellow bricks combined with a much smaller amount of red bricks largely determined the appearance of a southwestern Ontario city like London. London in particular made a virtue of necessity and took yellow brick to its cautious, businesslike bosom. Renouncing even the showiness of accent colours, London builders emphasized the bricks' resemblance to stone with a painted yellow trim the same shade as the bricks. These reassuringly monochromatic, utterly solid-looking houses line block after block in the older section of the town, only occasionally lightened with red brick trim. By the turn of the century, fashionable Londoners were tired of the local product and ready for something more exotic—red brick, which they imported from around Toronto. Because it was more expensive, red brick was often used for the front of the house while the sides and back were made from the familiar buff bricks.

The situation in Toronto was different. Clays that produced both yellow and red bricks were available along the Don River, so that Torontonians had the luxury of choice. When the city's Anglicans came to rebuild the Cathedral Church of St. James after the fire of 1849, they chose Ohio stone and yellow brick, which the architectural historian Eric Arthur described as "that curious Toronto brick that starts life as a rather bright yellow and enters old age as grey as the most venerable inhabitant." Yellow brick, which is difficult to clean, may well be at its best far from industry and railroads, but is a continuing, distinctive element in Toronto streetscapes.

The city's builders (and buyers) shifted allegiances with architectural fashions. They favoured the stonelike qualities of yellow brick for grandiose Second Empire buildings (like those at 226-228 Carlton Street), while red brick was thought to suit the warmly romantic Richardsonian Romanesque houses in the Annex. Some styles were judged compatible with both colours: there are certainly more red brick Bay-n-Gables, those cheerfully complex double and row houses that proliferated in Toronto in the last quarter of the nineteenth century, but the smart quartet at 484-490 Ontario Street shows that a buff yellow cladding is equally handsome.

One popular Victorian church style called for red and yellow bricks in the same building—an effect that was called "constructional polychromy" or "streaky bacon," depending on the eye of the beholder. The style was High Victorian Gothic and its champion was John Ruskin,

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Three Russian Imperial porcelain plates. From the left: Dessert Service, fruit design, Nicholas I. Diam, 21.5cm.; The Great Hunting Service, "The Chase", Nicholas I. Diam, 31cm.; Neo-Classical, monogram of Catherine The Great, Nicholas I. Diam, 26.5cm. From our collection of more than fifty Imperial Porcelains – together with more than fifty painted Icons of the 14th through 18th century; more than one hundred bronze and enamal Icons and crosses of the 12th through the 18th century; as well as Fedoskino and Palakh lacquer, Faberge and other enamals.
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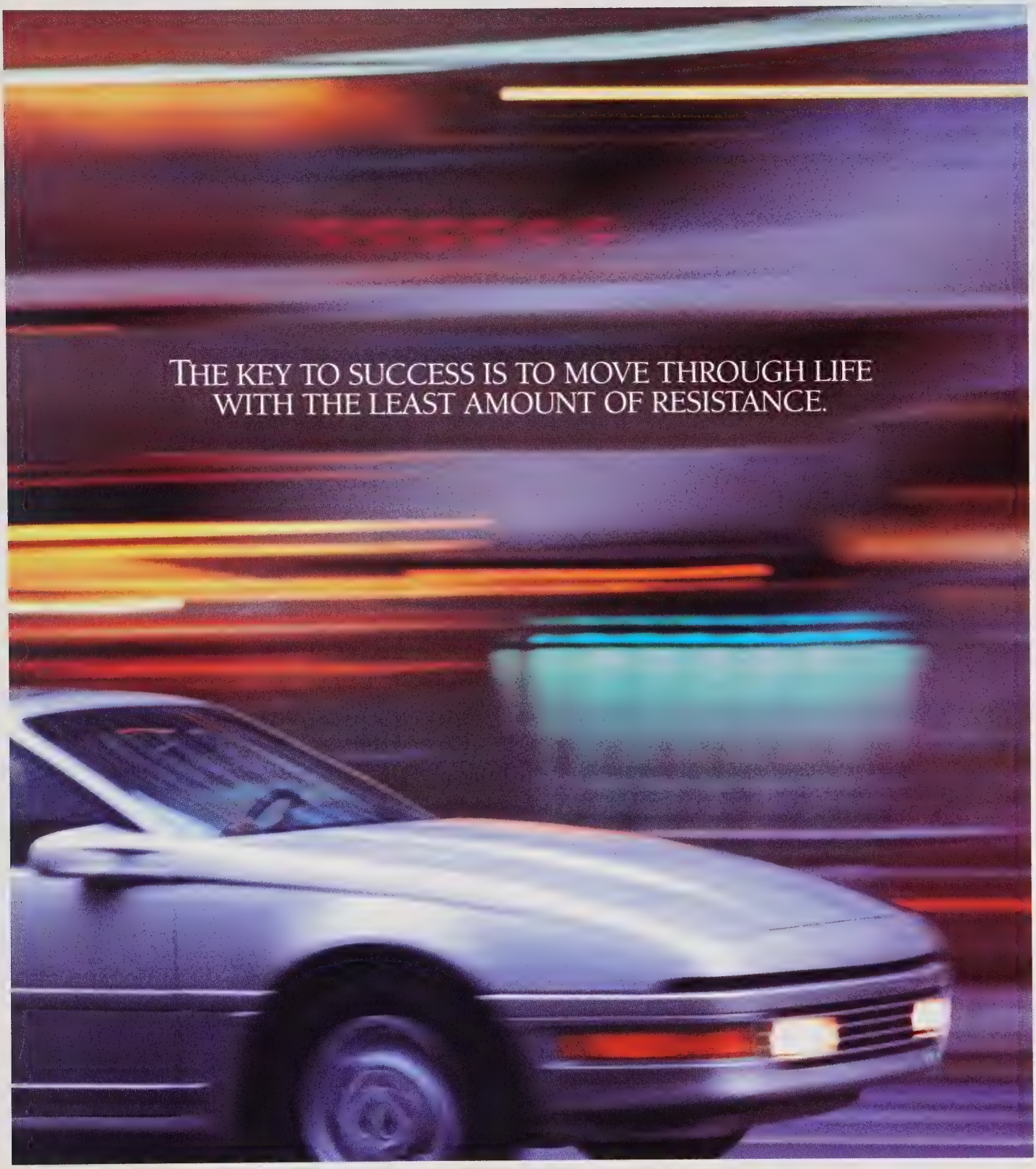

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who urged English architects to imitate in brick the flat surfaces and multicoloured stone and marble designs of Italian churches. Fashionable colonial architects followed suit in the 1860s and 1870s, and Toronto's stocks of both red and yellow bricks made possible the style's vivid, graphic effects.

The city has two outstanding polychrome churches, both on the east side. From certain perspectives, it looks as if St. Peter's (188 Carlton Street) is a red brick church with lavish yellow brick trim; from others, like a yellow brick church with an emphatic red trim—an entirely pleasurable optical confusion that enlivens this ground-hugging little church. All Saints Anglican Church (223 Sherbourne Street) is decidedly a yellow brick church, decorated even more extravagantly than St. Peter's with red stripes, bands, and triangles. With its drop-in centre very much a part of this downtown Toronto neighbourhood, dashing All Saints still manages to convey more than a whiff of Siena.

Not all polychromatic brick was ecclesiastical. In contrast to the restraint of the Georgian period, the mid-century picturesque movement looked on pattern and found it good—for any kind of building. The traveller in Peel, Halton, York, Durham, and Northumberland counties will remark farmhouses sporting borders, diamonds, lozenges, and other exuberances, sometimes yellow brick on red, sometimes red brick on yellow. It is brick aspiring to the condition of cross-stitch, and a welcome sight on country roads. And, *pace* Mr. Wilde, far from spoiling the effect of the architecture, this folkloric brick embroidery humanizes those tall Ontario farmhouses that, undecorated, can loom up very bleakly in the fields. Western Ontario's mantle of Erie clay, as the Bureau of Mines poetically called it, has served us well.

KATHERINE ASHENBURG
Katherine Ashenburg is arts and books editor of The Globe and Mail

Book Reviews

When I was an adolescent, *Kon-Tiki* by the Norwegian anthropologist Thor Heyerdahl was a book that everybody seemed to be reading. It appeared month after month on the list of "new" releases touted by public libraries the same way "squad car" and "X-ray" were invariably among the "new" words found in the appendix at the back of the dictionary. To be sure it was an attractive read. The premise was that the academic establishment was wrong, or partly wrong, in insisting that the ancestors of the Polynesian peoples had come from Southeast Asia. On the basis of certain geographical and ethnographical evidence, Heyerdahl believed that they might have come from the other direction, from South America. To prove the point, he built a raft of Inca design, called *Kon-Tiki*, and sailed from Peru to a Polynesian atoll 8000 kilometres away. Later, in the voyages described in his book *The Ra Expeditions*, he crossed the Atlantic in a reed boat in an attempt to show that the pre-Columbian residents of South America might themselves have had roots in Africa or the Middle East.

No one knew it at the time, but in the process Heyerdahl was inventing a certain type of book, in which scientists or, more often, serious laypeople, act out a thesis by using old technology to prove that some ancient feat or journey was feasible. He made possible all those books by such people as Tim Severin at the high end of the market and Robert F. Marx at the lower. And then there was his work on Easter Island, distilled in another book, *Aku-Aku*, and now expanded on in a new one, **Easter Island: The Mystery Solved** (Stoddart, $32.95). Here he was trying to refute the assumption, for so long implicit in New World anthropology, archaeology, and historiography, that aboriginal peoples, being less technologically advanced than Europeans, must therefore always have been incapable of social complexity or artistic sophistication. For how many generations did the Americans, for example, insist that the people loosely known as Mound-builders could not possibly have been the ancestors of the present-day natives? For that matter, how many people today are prepared to accept the assumption, racist as well as simple-minded, that any pre-Columbian monuments of great size and scope must have been the work of aliens from outer space?

These are the same kind of questions that Heyerdahl comes to grips with in *Easter Island* as he summarizes what is known of its former residents and sketches the long and often sad story of relations between the islanders and the whites, up to and including his own studies there, most recently in the mid-1980s.

The first Europeans to set foot on the island, hundreds of kilometres off the coast of Chile, and to see the monolithic statues, as high as three or four storeys, were Dutch. They arrived on Easter Sunday 1722 (hence the island's name). Peru thought to annex the island in 1770 but lost interest, and 110 years elapsed before Chile claimed it as its own. In the interim, the place was visited by, among others, Captain James Cook in 1774 (who publicized its puzzling "monuments of antiquity"), by Russians beginning in 1804, by Americans slavers in

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1804, and then by Peruvian slavers in 1862. These last "put an end to the aboriginal Easter Island culture" when they kidnapped the king and royal family and "nearly all the principal personalities and learned men of the community"—though 15 of the slaves were repatriated eventually, only to infect the other island residents with the smallpox they had contracted from their masters.

Scarcely more pleasant is the story of missionary contact. Successive evangelists tried to wean the islanders from their old religion. They succeeded well enough at first —to the extent that much of the traditional practices were lost—but created a climate for backlash and uprising.

Today, the island has a population of 2000 people (more than twice as many as in 1955) and an airport capable of receiving the biggest jets. What remains unchanged is the world's fascination with the huge elongated stone heads. Who built them, and when, and why?

Heyerdahl sifts all the accumulated research and presents it afresh for the benefit of ordinary intelligent readers. The picture one is left with is this: Sometime before the rise of the Incas on the mainland —that is, before the 12th century—Easter Island was inhabited by two races of people, the Long Ears (so called because they put weights in their ear lobes to extend them) and the Short Ears. The former, who were light-skinned and often had reddish hair suggesting a transatlantic heritage, began building the stone effigies for religious purposes, and for 200 years or so forced the Short Ears to help them. Eventually civil war broke out, in the course of which production of the sculptures ceased and most of the existing ones were toppled. The stone was quarried on site and moved great distances by being "walked," as one would walk a heavy fridge, rather than dragged, as previously believed.

It's easy to understand why Heyerdahl, who has also written a book on the sculptures *qua* art, has been intrigued with the subject for 40 years. Here he manages to convey the sum of what he and others have learned, without diluting the enthusiasm necessary for such a sustained effort.

In **Negotiating the Past: The Making of National Historic Parks and Sites** (McGill-Queen's University Press, $32.95), C. J. Taylor, a historian with the Canadian Parks Service of Environment Canada, breaks some fresh ground and finds it rather fertile. He examines the "layers of circumstance" by which certain historic places are selected for transformation into historical sites and then either reconstructed or restored or simply "commemorated." The process has always been rather subjective and inconsistent, given the "nexus of personalities, events, and attitudes playing off one another."

The British military's withdrawal from Canada in the last quarter of the nineteenth century might be said to have begun the preservationist movement by raising questions about what should become of that which had been abandoned. The answer, in the early days, was often supplied by local antiquaries and historical societies or by patriotic groups such as the IODE, or even by small entrepreneurs. Much of the initiative was motivated by, or at least tended to support, the Loyalist interpretation of Canadian history offered by a small pool of enlightened individuals who believed that their ancestors saved the country from being different from the Mother Country or worse.

Federal involvement in historical parks began in 1908, when Ottawa moved to keep the Plains of Abraham from being despoiled by commercial development, and assumed focus after the Great War. That was not the first time external threats sparked preservationists; three years earlier, the Ontario Historical Society had been mobilized to save Fort York in Toronto from the extension of a streetcar line. As government

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policy, historical site management reached its full expression in that other great period of Canadian nationalism, the 1960s, when Louisbourg was reconstructed, a project inspired to some extent by what the Americans had done with Williamsburg 40 years earlier. It was also in the 1960s that Dawson was reinvented (beginning with the Palace Grand Theatre, which was razed so that a replica could be erected).

Through it all has run an element of political caprice that is sometimes hard to distinguish from political necessity. The Plains of Abraham, for example, has tended to be seen by French Canadians as a site relating to the founding of Quebec and by English Canadians as the site of the victory of 1759. Similarly, the fort at Chambly near Montreal, which was a British installation in its later incarnations, is marketed as a cradle of québeçois history.

The fact that *Negotiating the Past* is reworked from the author's doctoral thesis at Carleton University is not a fair indication of its interest or its accessibility and, in any event, should not be held against it.

The Natural History of China, edited by Zhao Ji, Zheng Guangmei, Wang Huadong, and Xu Jialin (McGraw-Hill Ryerson) is quite a fascinating book and, at $29.95, a fair bargain when compared to others of the same size with less colour and lower production standards. In a more fundamental sense, its value is that it sees natural history as inseparable from both history and culture. Some Chinese fields have been under cultivation for three or four thousand years, as the stewards of the land have avoided, so far, some of the errors that contributed to the passing of other ancient states, particularly those in the Middle East. "The longevity of Chinese civilization," writes Christopher Elliott in his foreword, "must be attributed in part to sound environmental practices in agriculture and water conservancy. Wildlife management also has a long tradition in China."

Yet nowhere else are the resources under such threat from the crushing pressures of population, a process that sometimes has been made worse by politics. In the 1950s, as part of his efforts to fulfil the primary task of keeping the people fed, Mao Zedong instituted a sweeping program of reform, which included attempts to bring unsuitable land under cultivation; the result of much wasted effort was a great deal of environmental damage. Similarly, the widespread use of pesticides has so reduced the number of pests that the bird population has suffered considerably. Surprisingly little seems to have been written on this subject in English, particularly in recent years. This book is all the more welcome because so many of the species discussed are totally unfamiliar to most of us—as unfamiliar as the underlying problems are large.

Some other books of interest to *Rotunda* readers:

• **On the Brink: Endangered Species in Canada** (Western Producer Prairie Books, $29.95) is the work of a team of writers and researchers led by James A. Burnett. It is also a splendid example of the sort of book-publishing done by various agencies and departments of the federal government (Environment Canada in this instance) in cooperation with different private-sector publishing houses. The texts, photos, maps, and charts are broken down by region, but all lead to the same sad conclusion: in Canada today, one wildlife species in 40 is on the endangered list. Some thoughtful check-lists of what individuals might do are perhaps the book's most useful feature.

• In 1980, the Toronto editor Alberto Manguel collaborated with an Italian writer, Gianni Guadalupi, on a most unusual and, as it happened, highly successful book, *The Dictionary of Imaginary Places*: an encyclopedic gazetteer of the purely fictional localities (El Dorado, say, or the Slough of Despond) found in literature down through the centuries. **The Atlas of Legendary Places** by

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James Harpur and Jennifer Westwood (General, $42.95) is a British product that puts a twist on the same idea. The places here actually exist but are "legendary," although "storied" might be a better word in the circumstances for such places as Tintern Abbey, or the Taj Mahal. Not all of them are manmade (the list includes Ayers Rock in Australia and the Nile). Others are of interest only because of some theory of what they might once have been or represented, such as Cadbury Castle, which some people believe was the source of the Camelot legend, or the Greek isle of Thera, which some individuals point to as the basis for the story of Atlantis. As an editorial idea, the book is a bit of a muddle. But it is still a rich and interesting source book.

• **The Space Telescope** (Fitzhenry & Whiteside, $26.50) by Dr. George Field, a well-known American astronomer, and Dr. Donald Goldsmith, a well-regarded writer of popular science, is a study of the Hubble space telescope, which the authors show is the most significant advance in astronomy this century—or would have been, unquestionably, had the project gone smoothly. The book was published just prior to the launch of this 13.12-metre-long observatory. As we now know, the pictures it was supposed to relay back from 608 kilometres above the Earth were not what had been expected, owing to an error committed back in the early 1980s in the grinding of its 238.8-centimetre main light-gathering mirror. In fact, the Hubble became a famous fiasco. Shuttle astronauts are going to attempt to install corrective lenses on the Hubble in 1993. Until then, there is plenty of time to learn the great deal this book has to teach about the purposes and expectations of the observatory and how it fits into the scheme of astronomical knowledge.

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JAY INGRAM

It's the Weather

1. Chinooks, sciroccos, and the American Santa Ana are all hot dry winds that have dramatic effects, not only on the local weather, but also on the people who experience them. How do the winds affect people?

2. The dramatic political changes that swept Eastern Europe in 1989 had an effect on the weather as well. Meteorologists will surely note that winter temperatures in Romania became more extreme after the downfall of Nicolai Ceausescu. Why would that be?

3. What do rhododendrons, rattlesnakes, and crickets have to do with the weather?

4. Benjamin Franklin is renowned for the famous kite experiment in which he supposedly flew a kite during a thunderstorm. In fact Franklin didn't fly a kite during a thunderstorm, nor was this experiment as crucial as it is now portrayed. What was the great American scientist and statesman trying to demonstrate with his kite?

5. There are no recorded instances of its raining cats and dogs; however, there are records showing that it has rained fishes, frogs, lizards, and ants. If these records are true, how could these events have happened?

THE ANSWERS

1. These dry hot winds depress people. They have such a powerful impact that people who suffer their effects have given them names, such as the scirocco in Naples, the Santa Ana in California, and the hamsin in Egypt. Whatever the name, the effects of the winds seem to be the same. An English tourist in Naples in the 1700s wrote of the scirocco, "It gives a degree of lassitude both to the body and mind that renders them absolutely incapable of performing their usual functions." More recently, the Touring Club of Switzerland found in 1972 that automobile accidents rose 50 per cent when the Swiss version of the wind, the fohn, was blowing. There is little doubt that these winds have a disturbing and depressing effect. But why?

Very few scientists have studied this phenomenon despite the wealth of testimony about the debilitating influence of the winds. But in the 1960s and 1970s Dr. Albert Krueger, a professor emeritus at the University of California at Berkeley, suggested that the winds carry an abnormally high number of positively charged air ions—air molecules that have lost an electron or two. (The free electrons immediately attach to other molecules thereby changing them into negative air ions.) It is thought that the friction produced, for example, when huge masses of air flow rapidly over an area of land, can create such an abundance of air ions.

Krueger showed that positive air ions raise the blood levels of serotonin in mice, while negative air ions have the opposite effect. Serotonin is a molecular messenger that plays an important role in sleep and mood. Interestingly, an Israeli researcher later discovered that nearly half of the group of patients he studied had elevated levels of serotonin in their blood when the sharav was blowing. The results of other experiments suggest that high levels of serotonin contribute to anxiety, at least in lab rats and mice. So the thread of evidence running through these studies is that these winds carry an excess of positive air ions and so they can cause depression. The idea that positive air ions upset you while negative ions make you feel better led to the 1970s fad

ILLUSTRATIONS BY ANKER ODUM

of installing negative air ion generators in offices, but as yet this idea hasn't really caught on in the scientific world.

2. Early in 1990 a senior official at the National Meteorological Institute in Bucharest admitted that during the Ceausescu regime Romanian weather forecasters had been ordered never to report accurate winter temperatures below -15°C. The order had come down during the cold winter of 1985-86 when the temperature was actually below -20°C for two months. President Ceausescu was trying to combat concern about energy shortages. He even went so far as to order that in some parts of the country, temperatures lower than -10°C should never be reported. And Ceausescu's orders were not restricted to winter temperatures. The Ministry of Tourism instructed the beleaguered forecasters to lie about the weather at Black Sea resorts during cold summers. They were to claim that cold, cloudy, rainy, and windy conditions were perfect for swimming and sunbathing.

3. You can calculate the temperature by listening to or looking at these different animals and flowers.

The snake rattles faster as the temperature rises, gaining 2.7 rattles per second for every degree Celsius. The rattles range from zero rattles near freezing to 100 per second at 37°C. To determine the temperature, count the number of rattles per second, divide this figure by three and add about 10 per cent.

The leaves of the rhododendron begin to curl if the temperature drops to 2°C, and by -18°C the leaves have curled into a tube about the diameter of a pencil.

And the cricket? Professor A. E. Dolbear of Tufts University established this insect's importance in his paper "The Cricket as a Thermometer," published in 1897. The paper contained the famous formula $T = 50 + [(N - 40)/4]$, now known as Dolbear's Law. (T stands for temperature in Fahrenheit degrees.) Professor Dolbear appears to have assumed that all crickets are the same, which of course they are not. His formula holds for the snowy tree cricket, but the field cricket is not as dependable. Its chirp rate depends on many other factors, including age and mating success. And speaking of mating, it has been demonstrated that female crickets respond to males of their own species by measuring the chirp rate. Because that rate rises with the temperature, a female can be fooled: the female black-horned tree cricket, for example, responds to her own male at 21°C, the male silvery tree cricket at 26°C, and the four-spotted male cricket at 32°C.

4. Franklin was trying to show that lightning and electricity are the same thing. In his rationale for the experiment, Franklin pointed out that lightning and electricity have many properties in common: they both give light, move in a crooked direction, are swift, and can melt

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metals, etc. He also remarked that while it was known that electricity is attracted by points rather than by surfaces, the same was not known about lightning. In a line beloved by scientists, Franklin declared, "Let the experiment be made."

The first version of the experiment did not include a kite but rather a sentry box with a long pointed iron rod sticking out the top. Franklin postulated that if a man stood on an insulated platform inside the sentry box when an electrical storm was approaching, the iron rod might draw electricity out of a cloud and the man would see sparks. Dalibard, a Frenchman, successfully performed this experiment in 1852.

Franklin chose to use a kite when he performed the experiment himself. He attached a long pointed wire to the kite, and a key to the bottom of the kite string, near his hand. To insulate himself from any electricity, Franklin attached a piece of silk cord to the kite string and held on to that. Electrical charge collected by the wire flowed down the wet kite string, and Franklin was able to draw streams of sparks from the charged key by extending a knuckle towards it. Although Franklin was not so foolish as to perform the experiment in a severe thunderstorm, he was still lucky to survive. If the insulation had been wet, he would have become part of the electrical circuit. A Frenchman who tried to perform the experiment was killed in this way.

5. The list of animals that have dropped from the sky is very long. For example ants fell on Winnipeg in 1895 after a brief rain shower. In 1947 large-mouth bass, sunfish, and shad added substance to a shower over Marksville, Louisiana, and an alligator landed on Charleston, South Carolina, in 1843. Sometimes, as in the case of the Marksville fish, the animals are quite cold, and often only one species of animal has been part of the shower even though there are hundreds of different species living in the region.

The only reasonable explanation is that these creatures are vacuumed up in a powerful updraft from a thunderstorm or even a small tornado, carried in the air for some distance, then dropped suddenly back to Earth. The animals would be cooled in the lower temperatures at the high altitudes. The selectivity of animal species remains a mystery. Is all the material being carried through the air sorted by weight or size? This is one of those phenomena that defy close study because there is no way to predict when it will rain animals.

It's also possible for strange inanimate objects to fall from the sky. Oak leaves that dropped almost 13 kilometres away from the nearest oak trees, seaweed that landed in the Scottish hills, and unidentified berries that fell in Dublin are some of the most noteworthy examples.

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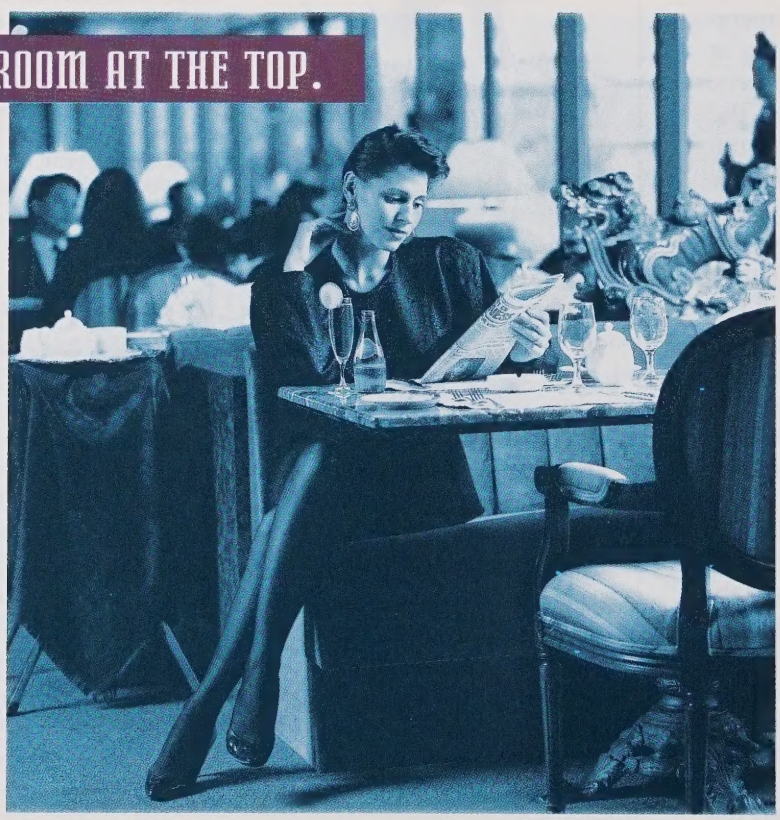

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